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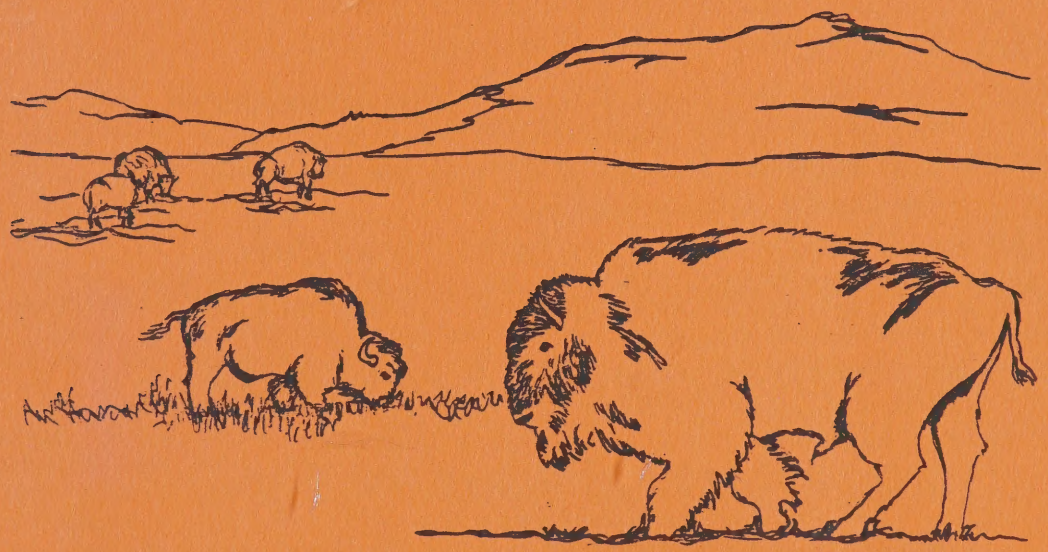

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SUMMER FOOD HABITS OF WOLVES IN WOOD BUFFALO NATIONAL PARK, ALBERTA, 1980

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INTRODUCTION

Wolves (*Canis lupus*) as predators are an integral part of any predator/prey system. Wood Buffalo National Park (hereafter referred to as WBNP) is one of the last areas to support wild populations of both wolves and bison (*Bison bison athabascae*). Wolf predation on bison has not been extensively studied and it was the concern of park managers that wolves may be an important factor in bison mortality despite earlier studies that concluded wolves were not detrimental to bison herd welfare (Fuller 1966). Therefore, in the summer of 1977 Parks Canada and the Canadian Wildlife Service (hereafter referred to as CWS) initiated field studies to investigate wolf/bison interrelationships in WBNP, Alberta. As a continuation of a systematic collection of wolf scat initiated during the summer of 1979, a similar procedure was followed during the summer 1980 covering primary bison ranges north of the Peace River to aid in the accurate determination of wolf food habits in the park. This article reports on the results of the 1980 summer scat collection made by the authors.

STUDY AREA

The study area was located in the north-eastern portion of WBNP, Alberta, north of the Peace River (Figure 1). This area is part of a continuum of the great central plains referred to as the Mackenzie Lowlands (Rowe 1972). Much of the study area lies within the Salt Plains, one of four elevational units in the park (Raup 1935). The area includes many prairie-like habitats characterized by often dry but poorly-drained alkali flats. Short and tall grass prairie habitats are interspersed with and separated by islands of white spruce (*Picea glauca*), tamarack (*Larix laricina*) and aspen (*Populus tremuloides*). The surrounding areas were dominated by jack pine (*Pinus banksiana*) and aspen on sandy soils and black spruce (*P. mariana*) and tamarack in moist depressions.

Wolf scat collection throughout the study area was made possible in the most part because of an all-weather gravel road that loops through this section of the park. This 250 km length road allowed for easy access to all portions of the study area and facilitated scat collection from a larger area than would otherwise be possible.

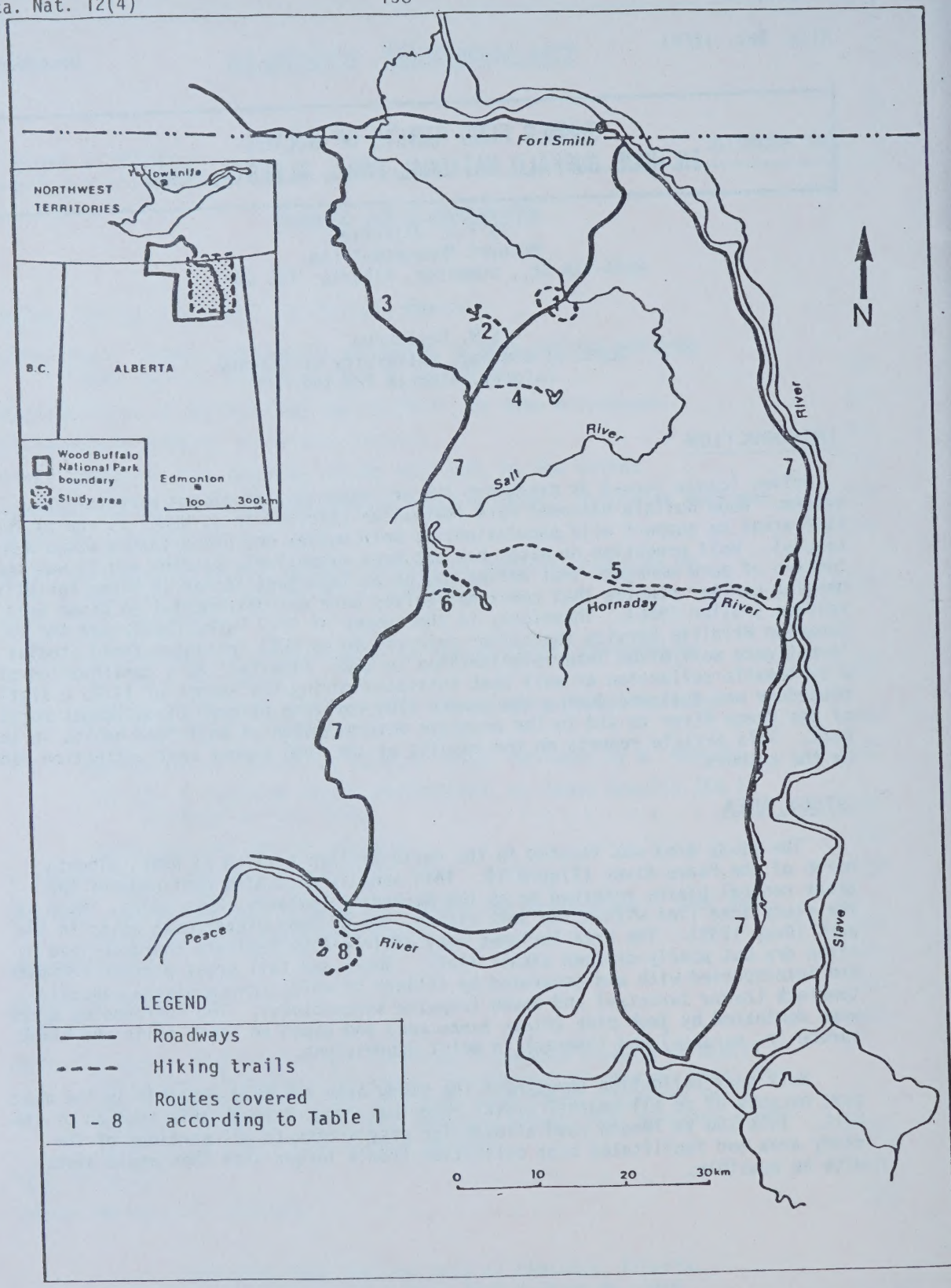

Figure 1. Location map of study area and routes travelled for scat collection.

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METHODS

Collection of scats was carried out from May to September 1980 on roadways and hiking trails which traversed primary bison range and was known to be occupied by wolves (see Figure 1). Scats were collected from most routes on 3 different occasions; early, mid- and late summer (Table 1). This was primarily done to help in accurately dating recently deposited scats. Scats collected and dated as winter were not included in the results for this study because of the relatively low sample size (n=46) and difficulty in accurately determining the deposition date. However, the results from their analysis was combined with other winter 1979-1980 data in Table 4. Scats were placed in plastic bags and each sample was tagged for location, deposition date (to month or season; as accurately as possible), collection date and collector. The scat material was analyzed by CWS personnel in Edmonton, Alberta. Microscopic analysis of hair scale patterns and identification of bone fragments, teeth and other remains were conducted to determine prey species. The data were organized according to their deposition date as follows: April and May, Spring; June to September, Summer. Per cent occurrence of identified food items for each prey species was calculated for each time period. This method tends to overestimate small prey and underestimate larger prey (Mech 1966, 1970), but since most other wolf food habit studies report data in this manner, this method was chosen for this study also.

TABLE 1. DATES OF SCAT COLLECTION TRIPS ON ROUTES ACCORDING TO FIGURE 1.

ROUTES	EARLY SUMMER	MID-SUMMER	LATE SUMMER
1 Salt River Trails	May 28		August 18
2 Rainbow Lakes Trail	June 4	June 26, July 22	
3 Parson's Lake Trail	June 3	July 7, July 8	August 19
4 Raup Lake Trail	May 22	June 15	
5 Hay Camp-Hornaday Cutline	May 30, May 31, June 1	July 28, July 29 July 30, July 31 August 1	
6 Lane Lake Trail		June 29	August 23
7 Loop Road (total)	May 23, May 24	July 3	August 17, September 9
8 Lake One Cutline		June 30, July 10 July 21	August 22

A more meaningful measure was also calculated: the ratio of prey biomass eaten (hereafter referred to as RPB). This measure was used to express the estimated weight of prey eaten per collectible scat for any prey as described by Floyd et al. (1978). By using an average prey weight which includes a ratio of different age and sex classes, the weight in kilograms of each prey species was estimated from the frequency of occurrence of food items in the total scat sample. The relative amount that each prey species contributed to the total biomass represented by the scat sample was calculated as the RPB.

RESULTS AND DISCUSSION

A total of 220 wolf scats containing 226 food items identified as prey remains were collected from May 21 to September 14, 1980. A total of nine prey species were identified (Table 2).

TABLE 2. PER CENT OCCURRENCE BY SEASON OF PREY SPECIES IDENTIFIED IN 220 WOLF SCATS COLLECTED IN WOOD BUFFALO NATIONAL PARK, MAY TO SEPTEMBER 1980.

PREY SPECIES	PER CENT (%) OCCURRENCE		
	SPRING	SUMMER	TOTAL
Bison	24.8	27.7	26.1
Moose	6.6	5.7	6.2
Beaver	14.9	7.6	11.5
Muskrat	28.1	22.9	25.7
Snowshoe Hare	21.5	27.6	24.3
Microtine	0.8	1.0	0.9
Bird	2.5	2.9	2.7
Other[1]	-	2.0	0.9
Undetermined	0.8	2.9	1.8
TOTAL NUMBER OF FOOD ITEMS	121	105	226
TOTAL NUMBER OF SCATS	116	104	220

1. Includes squirrel and porcupine

Bison, including bison calf, was the principle prey species (Table 2). Bison remains were identified in 26.1 per cent of the scat sample and represented 0.78 RPB (Table 3). Large ungulates collectively were the most important food source throughout the year comprising 0.899 RPB. This includes moose (*Alces alces*) and bison remains. Other less important prey were snowshoe hare (*Lepus americanus*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*). Remains of birds, small mammals (microtines) and other prey such as red squirrel (*Tamiasciurus hudsonicus*) and porcupine (*Erethizon dorsatum*) were identified in small proportions (Tables 2 and 3). Results of previous scat collections from WBNP indicate a similar pattern (Table 4).

Ungulate calves have been identified by many authors as an important prey source of wolves. However, once calves reach three to four months of age the hair is not easily distinguished from adult hair in prey remains. Therefore this study did not attempt to separate out this age class in the results even though this differentiation was noted in the laboratory analysis. Fritts and Mech (1981) observed significantly more white-tailed deer (*Odocoileus virginianus*) fawns in the total kill made by wolves than made by hunters. Pimlott et al. (1969) demonstrated a difference in the age ratio of wolf-killed white-tailed deer and those killed by automobiles and for research. Fawns consistently made up a larger portion of the wolf-killed deer than would be expected from that proportion of the total population. Kuyt (1972) suggested that caribou calves are killed at a

TABLE 3. RATIOS OF PREY BIOMASS (RPB) EATEN AS DETERMINED BY IDENTIFIED FOOD ITEMS IN 220 WOLF SCATS COLLECTED IN WOOD BUFFALO NATIONAL PARK, MAY TO SEPTEMBER 1980 CALCULATED ACCORDING TO FLOYD ET AL. 1978).

PREY SPECIES	ESTIMATED PREY WEIGHT (kg)	Ratio of prey biomass eaten (RPB) Spring	Summer	Total
Bison	400.00[1.]	0.760	0.803	0.780
Moose	250.00[1.]	0.130	0.107	0.119
Beaver	12.50[1.]	0.034	0.017	0.026
Muskrat	0.60[1.]	0.040	0.031	0.036
Snowshoe Hare	1.20[1.]	0.031	0.038	0.035
Microtine	0.03[2.]	0.001	0.001	0.001
Bird	0.50[1.]	0.004	0.004	0.004
Total Number of food items (sample size)		120	100	220

[1.] Obtained from Van Camp (1980).

[2.] Probably meadow voles; average weight 30 grams.

Table 4. Percent occurrence of prey remains identified from wolf scats collected in Wood Buffalo National Park, for several seasons from Summer 1977 to Summer 1980.

PREY SPECIES	PERCENT OCCURRENCE (%)					
	SUMMER[b] 1977	WINTER[b] 1977-78	SUMMER[c] 1978	SUMMER[d] 1979	WINTER[d] 1979-80	SUMMER[e] 1980
Bison	9.1	46.4	18.1	6.8	60.6	20.8
Bison calf			1.4	0.3	0.4	5.3
Moose	2.0	3.3	2.4	2.8	10.5	6.2
Beaver	14.1	1.4	6.7	14.0	2.2	11.5
Muskrat	14.1	14.4	15.5	32.2	1.8	25.7
Snowshoe Hare	11.1	16.7	37.3	28.6	13.0	24.3
Porcupine			2.8	1.4	1.8	0.4
Microtine	12.1	3.8	2.4	1.1	1.4	0.9
Vegetation	9.1	9.1	2.4	1.3	0.4	
Bird	16.2	4.9	9.5	5.0	1.4	2.7
Squirrel	9.1			1.8		0.4
Other[a]	3.0		1.6	2.8		
Unidentified				1.9	6.5	1.8
Total number of food items	99	209	496	791	277	226
Total number of scats	67	168	433	735	274	220

[a] Includes wolf hair, unidentified feathers, egg shells etc.

[b] Oosenbrug *et al.* (1980a)

[c] Oosenbrug *et al.* (1980b)

[d] Oosenbrug *et al.* (1981b) and winter sample of this study not included in Table 2.

[e] Spring and summer samples of this study

greater rate than their relative availability. Bergerud (1980) showed that there was a significant increase in the survival of caribou calves after the removal of wolves in a control program. This same pattern was observed in British Columbia, Alaska and the Northwest Territories over a common 25-year period (Bergerud 1980). Wolf-killed moose calves represented the single most abundant age class of a total of 328 winter moose kills examined on Isle Royale, Michigan (Peterson 1977). Initial observations of Oosenbrug and Carbyn (1980) revealed that of 12 wolf-killed bison examined from January 19 to March 31, 1979, all were adults. However, this is related to availability. There were no calves to be had in their intensive study area during the winter 1978-1979. Van Camp (1980) reported that calves were a substantial proportion of wolf-killed bison in the Slave River lowlands although adults did make up a larger percentage of the total kill.

Other prey species were more seasonally important except for snowshoe hare. Beaver and muskrat were most important during the summer period and contributed less to the wolf diet in the winter (Tables 2 and 3). Their seasonal habits and the environmental conditions reduce their relative availability to wolves during the winter season. These prey made up 37.2 per cent of the total sample and represented 0.052 RPB, second only to the ungulates in importance. Since most summer scats are associated with denning and rendezvous sites, the close proximity of good beaver and muskrat habitat would be reflected in the amount that these species were preyed upon. This result would also reflect the local population levels as demonstrated on Isle Royale, Michigan. There was a definite increase in the per cent occurrence of beaver identified in wolf scats, concurrent with an increase in the estimated number of active beaver colonies observed on the Island from 1958 to 1973 (Peterson 1977). Beaver densities observed by Gilbert (unpubl. *In* Fuller and Keith 1980) and Penner (1976) in the AOSERP study area of Northeastern Alberta reveal a direct relationship between beaver population levels and per cent occurrence of beaver in wolf scats collected (Fuller and Keith 1980). Year to year results from WBNP suggest that beaver and muskrat provide a consistent prey source. Data on their population levels was not available.

Other small mammals, birds and miscellaneous prey species were identified in small amounts and are important because of the seasonal change in a wolf pack's activity. During the critical pup-rearing season, their activity is centered around the den site. The wolves no longer travel and hunt as a pack but hunt alone, or in small groups returning to the den site to help feed the pups. The large ungulates are very formidable prey and would be difficult to kill for a single wolf; however, this does occur (Mech 1970, Young 1944). It appears that wolves generally depend upon the relative abundance of various smaller prey in close proximity to the den.

The most important small mammal in the wolf's diet was the snowshoe hare. Hare remains were identified in 24.3 per cent of the total sample and represented 0.035 RPB (Tables 2 and 3). The importance of snowshoe hare is its relatively consistent use season to season (Table 4). Results from other North American studies are more variable (Table 5). Snowshoe hare populations are cyclic with an approximate ten-year period (Keith and Windberg 1978). The current phase and level of the population could well be reflected in the per cent occurrence of hare remains in wolf scat as has been discussed earlier for beaver. This was

TABLE 5. PROPORTIONS OF VARIOUS PREY SPECIES REPORTED IN WOLF FOOD HABIT STUDIES IN NORTH AMERICA.

LOCATION	SEASON[a]	Bison	Moose	White-tailed Deer	Elk	Caribou	Beaver	Snowshoe Hare	Other Small Mammals	Birds	Other Animals	Soil and Vegetation	METHODS	
Wood Buffalo National Park, Alberta	S	26.1	6.2	0	0	0	37.2[b]	24.3	1.7[d]	2.7	0	0	Scat analysis	This Study
Wood Buffalo National Park, Alberta	W/S	22.6	3.5	0	0	0	29.5[c]	26.3	5.7[e]	6.2	1.8	2.8	Scat analysis	adapted from Dosenbrug *et al.* 1980a, b, 1981
Keewatin District, Northwest Territories	S	0	0	0	0	47.0[f]	0	0.9[g]	13.9	14.9	23.5	93.0[h]	Scat analysis	Kuyt (1972)
Kluane National Park, Yukon Territory	S[i]	0	49.0	0	0	0	4.8	0	37.1	0	9.2	0	Scat analysis	Theberge and Cottrell (1977)
	S[j]	0	54.6	0	0	0	18.8	8.8	4.7	0	12.1	0	Scat analysis	
Southcentral Alaska	S[k]	0	28.3	0	0	4.5	32.5	30.5	1.7	1.7	0.6	0	Scat analysis	Stephenson (1978)
	S[l]	0	52.2	0	0	0	33.3	3.6	0	0	9.4	1.4	Scat analysis	
Isle Royale, Michigan	W/S	0	76.0	0	0	0	11.0	3.0	0	1.0	1.0	8.0	Scat analysis	Mech (1966)
Superior National Forest, Minnesota	S	0	13.6	56.9	0	0	9.4	3.0	3.6	tr.	6.9	6.6	Scat analysis	Van Ballenberghe *et al.* (1975)
	W	0	21.0	66.0	0	0	ND[m]	ND	ND	ND	ND	ND	Scat analysis[n]	
Superior National Forest, Minnesota	W	0	0	80.4	0	0	0	7.8	7.8	5.9	3.9	0	Stomach analysis[o]	Stenlund (1955)
Wisconsin	W/S	0	0	97.0	0	0	0	5.0	3.8	0.5	0.5	27.0	Scat analysis[p]	Thompson (1952)
Prince Albert National Park, Saskatchewan	S	0	tr.	29.0[q]	54.0	tr.	11.0	3.0	3.0	0	0	0	Scat analysis	Carbyn *et al.* (1975)
Algonquin Park, Ontario	S[r]	0	5.0-15.0	33.0-76.0	0	0	7.0-55.0	tr.	7.0-11.0	tr.	0	0	Scat analysis	Voight *et al.* (1976)
Algonquin Park, Ontario	S	0	8.5	80.5	0	0	7.1	0.6	0.9	0	2.4	0	Scat analysis	Pimlott *et al.* (1969)
	W	0	0.6	99.0	0	0	tr.	0	tr.	0	0	0	Kill remains	
Algonquin Park, Ontario	S	0	14.8	29.2	0	0	48.6	1.5	3.0	0	3.0	0	Scat analysis	Theberge *et al.* (1978)
Pakesley, Ontario	S	0	2.0	11.0	0	0	75.0	tr.	12.0	tr.	0	0	Scat analysis	Voight *et al.* (1976)
Pakesley, Ontario	S	0	1.4	27.3	0	0	59.3	3.2	0	0	8.8	0	Scat analysis	Pimlott *et al.* (1969)
Marten River, Ontario	S	0	18.0	1.0	0	0	74.0	tr.	7.0	tr.	0	0	Scat analysis	Voight *et al.* (1976)
Marten River, Ontario	S	0	17.3	42.2	0	0	37.3	0.5	0	0	2.9	0	Scat analysis	Pimlott *et al.* (1969)

[a] Season for which food habits studied: S-summer; W-winter; W/S-winter and summer.
[b] Includes beaver (11.5%) and muskrat (25.7%).
[c] Includes beaver (8.8%) and muskrat (20.7%).
[d] Includes squirrel (0.4%), porcupine (0.4%) and microtines (0.9%).
[e] Includes squirrel (1.8%), porcupine (1.6%) and microtines (2.3%).
[f] Includes adults (38.0%) and calves (9.0%).
[g] Represents arctic hare.
[h] Represents portion of non-prey items identified in scats.
[i] Onion den reported by Theberge and Cottrell (1977).
[j] Kathleen den reported by Theberge and Cottrell (1977).
[k] From scats collected near den.
[l] From scats collected near rendezvous site.
[m] ND - no data.
[n] Only 69 scats collected in winter.
[o] Percent of stomachs in which food item found.
[p] Percent of scats in which food item found.
[q] Includes both mule and white-tailed deer.
[r] Ranges for four years data.

tr. Trace

suggested by Fritts and Mech (1981), when a general decline in the estimated hare population as measured by pellet counts. Hare populations have not been monitored in WBNP but areas surveyed in Alberta and British Columbia suggest that peak hare populations existed in 1979-1980 (Penner 1979, 1980). The observed variability in results from year to year suggests such a relationship may exist.

SUMMARY

Wolf food habits in WBNP are variable but ungulates are the principle prey species year round. During the summer period ungulates are generally less important as wolves appear to depend on the local abundance of smaller prey species in close proximity to the home site. This is a result of a seasonal change in wolf activity from travelling and hunting as a cohesive group during the winter period to caring for the pups during the summer period. The summer period is marked by an increase in the use of smaller prey particularly beaver and muskrat. This is probably related to their increased availability at this time of year. Snowshoe hare is an important prey species year round but does not contribute a substantial biomass to the wolf diet. Microtines, birds and other prey are not important both in terms of frequency of occurrence or biomass intake.

ACKNOWLEDGEMENTS

Sincere thanks are expressed to Parks Canada for funding of this project. P. Jalkotzy conducted the field work with assistance and supervision from S. Oosenbrug. CWS laboratory technician, Al Kennedy, conducted all the laboratory scat analysis. The Park Superintendent and staff were very helpful with additional data, information and observations.

LITERATURE CITED

Bergerud, A.T. 1980. A Review of the Population Dynamics of Caribou and Wild Reindeer in North America *In* Reimers, E., E. Gaare and S. Skjenneberg (eds.). Proc. 2nd Int'l. Reindeer and Caribou Symp. Roros, Norway.

Carbyn, L.N., W. Etherington, M. Sather and K. Whaley. 1975. Field studies on wolf populations in Prince Albert and Riding Mountain National Parks for interpretive programmes. Prep. for Parks Canada, Prairie Region, by Can. Wildl. Serv. 60 pp.

Floyd, T.J., L.D. Mech and P.A. Jordan. 1978. Relating wolf scat content to prey consumed. J. Wildl. Mgmt. 42: 528-532.

Fritts, S.H. and L.D. Mech. 1981. Dynamics, movements and feeding ecology of a newly protected wolf population in Northwestern Minnesota. Wildl. Monog. 80: 1-79.

Fuller, T.K. and L.B. Keith. 1980. Wolf population dynamics and prey relationships in Northeastern Alberta. J. Wildl. Mgmt. 44(3): 583-602.

Fuller, W.A. 1966. The ecology and management of the bison of Wood Buffalo National Park. Can. Wildl. Serv. Mgmt. Bull. Ser. 1 No. 16. 52 pp.

Keith, L.B. and L.A. Windberg. 1978. A demographic analysis of the snowshoe hare cycle. Wildl. Monogr. 58: 1-70.

Kuyt, E. 1972. Food habits of wolves on barren-ground caribou range. Can. Wildl. Serv. Rep. Ser. No. 21. 36 pp.

Lockie, J.D. 1959. The estimation of the food of foxes. J. Wildl. Mgmt. 23: 224-227.

Mech, L.D. 1970. The Wolf: the ecology and behavior of an endangered species. Nat. Hist. Press, Garden City, N.Y. 384 pp.

Mech, L.D. 1966. The wolves of Isle Royale. Fauna of the National Parks of the United States. Fauna Series 7. 210 pp.

Oosenbrug, S.M. and L.N. Carbyn. 1981a. Winter predation of bison and activity patterns of a pack of wolves in Wood Buffalo National Park. Can. Wildl. Serv./ Parks Canada. Unpubl. Report. 22 pp.

Oosenbrug, S.M., L.N. Carbyn and D. Anions. 1981b. Wood Buffalo National Park Wolf/ Bison studies. Progress Rep. No. 3.

Oosenbrug, S.M., L.N. Carbyn and D. West. 1980a. Wood Buffalo National Park Wolf/ Bison studies. Progress Rep. No. 1.

Oosenbrug, S.M., L.N. Carbyn and D. West. 1980b. Wood Buffalo National Park Wolf/ Bison studies. Progress Rep. No. 2.

Penner, D.F. 1979. Furbearer studies in the Liard River valley, British Columbia. Rep. prep. for British Columbia Hydro and Power Authority by McCourt Mgmt. Ltd. 121 pp.

Penner, D.J. 1980. Preliminary draft report - wildlife impact assessment, Monkman Coal Project. Prepared for Petro-Canada by McCourt Mgmt. Ltd. 173 pp.

Peterson, R.O. 1977. Wolf ecology and prey relationships on Isle Royale. Nat. Park. Serv. Scientific Monogr. Ser. No. 11. 210 pp.

Pimlott, D.H., J. Shannon and G. Kolenosky. 1969. The ecology of the timber wolf in Algonquin Park, Ontario. Dept. of Lands and Forests. Rep. Prep. (Wildlife) No. 87. 99 pp.

Raup, H. 1935. Botanical investigations in the Woof Buffalo Park. Nat. Mus. Canada Bull. 74. Bio. Ser. 20. 174 pp.

Rowe, J.S. 1972. Forest regions of Canada. Dept. of the Environ., Can. For. Serv. Publ. No. 1300. 172 pp.

Stephenson, R.O. 1978. Unit 13 wolf studies. Vol. 1. Proj. progress rep. Alaska Dept. of Fish & Game. 75 pp.

Stenlund, M.H. 1955. A field study of the timber wolf in the Superior National Forest, Minnesota. Minn. Dept. Cons. Tech. Bull. No. 4. 55 pp.

Theberge, J.B. and T.J. Cottrell. 1977. Food habits of wolves in Kluane National Park. Arctic 30: 189-191.

Theberge, J.B., S.M. Oosenbrug and D.H. Pimlott. 1978. Site and seasonal variations in food of wolves, Algonquin Park, Ontario. Can. Field-Nat. 92(1): 191-194.

Thompson, D.Q. 1952. Travel, range and food habits of timber wolves in Wisconsin. J. Mammal. 33: 429-442.

Van Ballenberghe, V., A.W. Erickson and D. Byman. 1975. Ecology of the timber wolf in Northeastern Minnesota. Wildl. Monogr. No. 43: 1-43.

Van Camp, J. 1980. Predation on bison in the Slave River Lowlands. Unpubl. Proj. Rep. N.W.T. Wildl. Serv. 26 pp.

Voight, D.R., G.B. Kolenesky and D.H. Pimlott. 1976. Changes in summer foods of wolves in Central Ontario. J. Wildl. Mgmt. 40: 663-665.

Young, S.P. 1944. The wolves of North America, Park I. Amer. Wildl. Instit., Washington, D.C. 385 pp.

SELECTED BIOTA OF BRETONA POND AND VICINITY

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INTRODUCTION

Bretona Pond (also known as Ott's Pond) is located at the headwaters of Mill Creek in the County of Strathcona (S.E. Section 33, Township 51, Range 23), adjacent to Highway 14, and approximately 1 km east of the Edmonton city limit. The pond and adjacent lowland comprise areas of approximately 64 acres and 60 acres, respectively.

Located in the midst of prime agricultural land, Bretona Pond has historically, and is presently, attracting significant numbers of breeding and staging waterfowl and other waterbirds. The surrounding lowland and groves of deciduous trees provide ideal habitat for raptors (primarily hawks, falcons and owls), songbirds and a variety of other birds. In addition, muskrats reside in the pond, and white-tailed deer frequent the area.

This rich wildlife attracts many natural historians and 'birders' from Edmonton and area. The area is particularly attractive to urban naturalists because the pond is one of the largest of its kind within a few minute's drive of Edmonton and Sherwood Park.

With the recent encroachment of Edmonton city limits toward Bretona Pond, the potential for the area to be developed for industrial and/or residential purposes is increased. Developments of this sort would seriously affect the existing biota and general ecological status of the pond. It is the biological richness of the area and its proximity to Edmonton and Sherwood Park that provide the major impetus for this report. Following are brief descriptions (by no means exhaustive) of the biota present at Bretona Pond and vicinity. Emphasis has been placed on the most common or interesting floral and faunal species or species groups observed or heard in the area by the author. Systematic biological sampling has not been conducted.

VEGETATION

Bretona Pond and surrounding lowland historically have been, and presently are being, used for private cattle watering and grazing. This practice has affected (in fact, largely determined) the vegetation composition of the pond shoreline and lowland to the point where vegetation typical of prairie pond shorelines is found only immediately adjacent to the pond.

A variety of sedges dominate the pond shoreline. Cattails are abundant along the western and northern shorelines. These, plus several other emergent species, form a narrow band around the pond. Several water-associated flowering species may be found growing close to the water's edge. A mixture of native and seeded grasses dominate the surrounding lowland. Numerous flowering species (see Table 1) are scattered throughout this area. A gently rising slope along the eastern shoreline of the pond is dominated by balsam and aspen poplar. Understory shrubs and wild flowers associated with the poplar grove include willow, snowberry and violets.

AMPHIBIANS

The most common amphibian in the vicinity of Bretona Pond is the wood frog, which is most easily observed and heard during dusk hours, the period during which it becomes most active. Its preferred habitat in the area appears to be

TABLE 1. SOME OF THE MORE COMMON FLORA OF BRETONA POND AND AREA*

Several species of horsetail	White (Dutch) clover
Several submergent species	White wood violet
White spruce	Bog violet
Common cattail	Fireweed
Giant bur-reed	Cow parsnip
Several species of seeded grasses	Water parsnip
Several species of native grasses	Red osier dogwood
Several species of sedge	Tall mertensia
Great bulrush	Wild mint
Duckweed	Hedge nettle
Star-flowered solomon's seal	Toad-flax
Blue-eyed grass	Common plantain
Balsam poplar	Northern bedstraw
Aspen poplar	Snowberry
Several species of willow	Common yarrow
Common nettle	Small-flowered everlasting (Pussy-Toes)
Western dock	Aster
Canada anemone	Canada thistle
Crowfoot	Annual hawksbeard
Meadow rue	Fleabane
Saskatoon	Scentless chamomile
Wild strawberry	Pineapple weed
Chokcherry	Arrow-leaved coltsfoot
Wild rose	Ragwort
Wild raspberry	American goldenrod
Alfalfa	Smooth-leaved goldenrod
White sweet clover	Sow thistle
Yellow sweet clover	Common dandelion

*As recorded by the author

tall ungrazed grasses and sedges. The only other amphibian observed in the area by the author is the blotched tiger salamander. This species most often has been observed either in or nearby northern pocket gopher burrows.

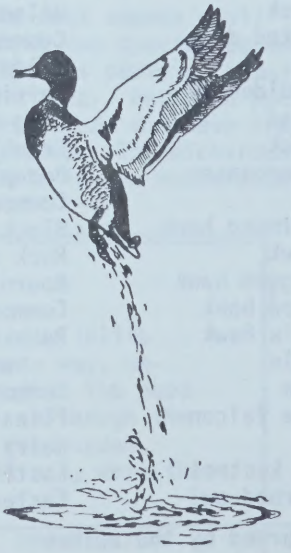
BIRDS

Approximately 100 species of birds have been observed in the area by the author between 1978 and the present (Table 2). The pond is one of the most productive and interesting areas for waterbirds close to Edmonton. Bretona Pond and vicinity attract thousands of waterfowl during spring and fall migrations. On several occasions, 2000-3000 ducks have been observed on the pond. Numerous waterfowl species nest at or near the pond including Mallards, American wigeons, Northern shovelers, scaups and Ruddy ducks. The most common nesting species are dabbling ducks; diving ducks primarily use the pond as a resting area, particularly during spring migration. Groups of Whistling swans (numbering up to 40) have been observed on the pond following ice break-up, and have remained on the pond for up to a week at a time. Canada geese are often seen on the pond during migration, and in 1981, small groups of this species frequented the pond until mid-June.

Two species of raptors are known to nest in the vicinity of the pond. American kestrels nest in dead balsam poplar trees located along the eastern shoreline of the pond, and two Red-tailed hawk nests have been recorded near the pond between 1978 and the present. Short-eared owls are suspected of nesting; a pair was observed on a regular basis during the spring of 1981. The Marsh hawk and Red-tailed hawk are the most common raptors in the area during spring and summer. Great horned owls are seen most frequently during the fall. Other raptors (see Table 2) appear to stop over briefly during migration, or have been observed only in flight. During the autumn of 1979 a Gyrfalcon remained at the pond for several days and was observed attempting to kill ducks. Bald eagles are observed near the pond on a daily basis during spring migration.

The gray partridge is the most common species of upland game bird that has been seen in the area by the author. Groups of two to eight birds have frequented the vicinity year round. Sharp-tailed grouse and Ring-necked pheasants are seen only occasionally.

American coots nest in significant numbers along the shoreline of the pond. A close relative of the coot, the Sora, is frequently heard at the pond but seldom seen due to its secretive nature. Killdeer, Common snipe and Spotted Sandpipers are the most common shorebirds at the pond, and all nest in the vicinity. Other shorebird species are either common or have only been observed during spring and fall migration. In 1980, several Wilson's phalaropes nested at the pond.



Gulls and terns are common in the area. During the summer, gulls are seen daily flying between the Clover Bar landfill site and points southeast of Bretona Pond. Although both Common and Black terns may be seen feeding at the pond, only Black terns have been recorded as nesting there. During the nesting and rearing periods, they are one of the most vocal species at the pond, screaming and diving at intruders that appear to be threatening

its nest or young.

Rock doves have been observed both in small and large flocks, flying over the lowland surrounding the pond. They often pick grit along the roadways located immediately east and south of the pond. In 1980, a single Mourning dove was seen perched on a power line adjacent to the author's home, located only a few hundred metres southwest of the pond.

During the spring, Common nighthawks are seen and heard high above the pond, and are suspected of nesting in the immediate vicinity. Several species of woodpeckers (see Table 2) may be seen in the long narrow grove of trees along the eastern shoreline of the pond.

The author has observed approximately 35 species of passerines at or in the immediate vicinity of Bretona Pond. Eastern kingbirds may be observed perched on barbwire fences surrounding the pond and lowland. Tree swallows nest, among other places, in the bluebird nest boxes located on fence posts along the roadways east and south of the pond. Barn swallows nest in numerous areas adjacent to the pond, including at the author's home.

TABLE 2. BIRDS OBSERVED AT OR NEAR BRETONA POND*

Horned grebe	Short-eared Owl	Olive-sided flycatcher
Red-necked grebe	Snowy owl	Horned lark
Whistling swan	Gray partridge	Barn swallow
Canada goose	Sharp-tailed grouse	Tree swallow
White-fronted goose	Ring-necked pheasant	Gray jay
Snow goose	Great blue heron	Black-billed magpie
Mallard	Sandhill crane	Common crow
Pintail	Sora	Common raven
Gadwall	American coot	Black-capped chickadee
American wigeon	Black-bellied plover	American robin
Northern shoveler	Killdeer	Mountain bluebird
Blue-winged teal	Spotted sandpiper	Bohemian waxwing
Green-winged teal	Solitary sandpiper	Northern shrike
Redhead	Yellowlegs sp.	Common starling
Canvasback	Wilson's phalarope	Yellow warbler
Ring-necked duck	Common snipe	House Sparrow
Scaup sp.	Unidentified "peeps"	Western meadowlark
Common goldeneye	Herring gull	Yellow-headed blackbird
Bufflehead	Ring-billed gull	Red-winged blackbird
Ruddy duck	Franklin's gull	Brewer's blackbird
Common merganser	Bonaparte's gull	Brown-headed cowbird
Goshawk	Common tern	Evening grosbeak
Sharp-shinned hawk	Black tern	Pine grosbeak
Marsh hawk	Rock dove	Redpoll sp.
Rough-legged hawk	Mourning dove	American goldfinch
Red-tailed hawk	Common nighthawk	Vesper sparrow
Swainson's hawk	Ruby-throated hummingbird	Clay-colored sparrow
Bald eagle	Common flicker	Chipping sparrow
Gyrfalcon	Pileated woodpecker	White-throated sparrow
Peregrine falcon	Hairy woodpecker	Song sparrow
Merlin	Eastern kingbird	Savannah sparrow
American kestrel	Eastern phoebe	Lapland longspur
Great horned owl		Snow bunting

*As recorded by the author

The Black-billed magpie is the most common corvid, and resides in the area year round. Several nests are located in poplar trees adjacent to the pond. The two most common thrushes of the area are American robins and Mountain bluebirds, both of which nest in the area. One of the most abundant passerines at the pond during summer is the Red-winged blackbird which nests in emergent vegetation along the southern, western and northern shorelines of the pond. One to two Yellow-headed blackbirds have also nested annually around the pond during the past three years. The three most common sparrows at the pond during summer are the Savannah sparrow, Song sparrow and Chipping sparrow. Redpolls are common in the area during winter, and Snow buntings and Lapland longspurs are abundant during spring and autumn migration.

MAMMALS

A total of 12 species of mammals have been observed in the area by the author. The muskrat is the most visible mammal at Bretona Pond, particularly following freeze-up (the period when push-ups are constructed) and following ice break-up (the period when animals forage actively). Beavers have constructed a series of small dams on Mill Creek a short distance downstream from the outlet of the pond. This species presently does not reside in the pond itself.

Snowshoe hares are abundant in the area and utilize the various clumps of shrub and tree growth surrounding the pond for cover. It has not been uncommon to see groups of 3-4 individuals feeding together, particularly during the winter.

Striped skunks and long-tailed weasels have been observed in the area frequently. Skunks have been seen most often during spring evenings, and weasels during the winter months.

Coyotes are also abundant near the pond, and hunt for mice, birds and frogs along the shoreline. For the past three years, at least three coyote families each year have been recorded as occurring within about 1 km of the pond. One red fox has been observed near the pond, and several inactive fox dens are located in the vicinity.

The white-footed deer mouse and red-backed vole are the most common small rodents. Immediately following snowmelt, winter nests of these two species become visible throughout the lowland surrounding the pond. Both species serve as a major food source for several larger bird and mammal species in the area. Northern pocket gophers are abundant in the area immediately surrounding the lowland and have created many of the well-known mounds as they extend their burrow systems. The Richardson's ground squirrel is also found above the lowland, but not nearly in the numbers that it occurred historically.

OVERHEARD. . .

"Habitat destruction is the most serious threat to wildlife in the near and distance future. Since it is, in a way, unintentional, it could be defended on the grounds that the need of human beings are higher on the priority list - although the ivory-billed woodpecker, Mexican grizzly, pygmy chimpanzee, white-tailed gnu, and a host of others might well ask, were they able, 'Whose list?'"

Submitted by Murray A. Tozer, from "The Endangered Ones" by James. A. Cox

THE MACKENZIE BARRENS

by Dorothy Dickson
231 Scarboro Ave. SW, Calgary AB T3C 2H4

One day early last August my husband and I sat for three hours peering through telescopes watching two wolves stalk, chase, kill and eat a caribou. From the observation lounge of Oldsquaw Lodge, perched on the only hill in the Mackenzie Barrens, we commanded a view of over half the 200 sq. km of the plateau. At an elevation of 1500 m and surrounded by mountains, this tundra-covered plateau is one of the most fascinating places we have visited. It is situated between the Mackenzie Mountains to the northeast and the Selwyns to the southwest, and is traversed by the northern part of the Canol (Canadian Oil) Road. This road was built during the second World War to service an oil pipeline from Norman Wells in the NWT to Whitehorse, Yukon. The pipeline was abandoned in 1945 and, while the road from near Whitehorse to the Yukon/NWT border at Macmillan Pass has been kept in reasonably good repair for some mining and exploration activity, the part in the NWT is passable only by a tough 4-wheel drive vehicle, on horseback or on foot - if you don't mind wading the oft-turbulent rocky rivers!

Travelling north from Macmillan Pass, the road drops into the valley of the Tsichu River and then climbs through birch and willow scrub onto the plateau some 20 km from the Pass. In places the scrub continues up on to the barrens but most of the area is undulating, hummocky tundra. It is extremely rough ground with bogs, sloughs, lakes, narrow watercourses and deep, water-filled holes hidden among the tussock-grass. The bedrock of the plateau is, like the surrounding mountains, sedimentary rock, but this is covered with glacial till and dotted with boulders of igneous rock brought from the Canadian Shield by past glaciers. Permafrost is only about 30 cm below the surface and some of the hummocks are palsas.

The flora and fauna of the area are an almost bewildering mixture of alpine, arctic and boreal species. Among the grasses and sedges of the tundra is a great variety of lichens and mosses still needing to be accurately identified and listed. Some of the species were those familiar to us in Alberta but many others, for example *Saxifraga hieracifolia, Pedicularis sudetica, Chrysosplenium tetrandum, Spirea Beauverdiana* and *Thalictrum alpinum* were different. On the 60 m.-high hill behind the lodge were the last of sheets of golden arnica (probably *A. Lassingii*) which, with drooping heads and reflexed petals, looked remarkably like glacier lilies. We were surprised to find alpine harebells (*Campanula lasiocarpa*) growing on the tundra but not on the mountains, and the plentiful roseroot (*Sedum rosea*) growing up to 40 cm tall.

Birch and willow scrub cover nearly a quarter of the plateau, especially in the southeast section and where the high slopes sweep down to the tundra or streams meander out from the mountains. The willow is an important food for many of the mammals of the area but it is interesting, and perhaps a little puzzling, that no animals seem adapted to use the birch except as nesting sites.

There are some trees - mainly poplar and spruce - in the river valleys at the edges of the tundra and here also are carpets of *Equisetum* and patches of *Hedysarum Mackenzii* and *alpinum*, all important food sources for the mammals, especially the grizzlies.

As you climb the surrounding mountains and walk the seemingly bare ridges the usual species such as Moss campion, River Beauty, Dryas, Alpine Campion and Purple and other Saxifrages are found. But, here again, some species are different - *Saxifraga tricuspidata* rather than *bronchialis, Pyrola grandiflora* (the Arctic wintergreen), not *P. asarifolia*, etc. We saw the big Jacob's ladder, *Polemonium acutiflorum* and were particularly delighted to find alp lilies (*Lloydia serotina*), *Geum Rossii* and a most graceful alpine poppy, *Papaver Keelei*. A list of over 200 plants so far found in the area is now available but much is still left for ardent botanists to discover.

The bird list, to date, contains nearly 120 species and more are added each year. Wherever you walk on the tundra you are surrounded by birds. Pipits, Horned Larks, Lapland and Smith's Longspurs, snipes and Savannah Sparrows pop up from under your feet. Golden Plovers flute from the tops of tussocks and boulders and White and Golden-crowned Sparrows call from the small bushes. Along the edges of the sloughs, Least Sandpipers, yellowlegs and dowitchers feed while phalaropes spin on the water. On the larger lakes are Common, Artic and Red-throated Loons, grebes, scoters, mergansers and at least twelve species of duck including the talkative Oldsquaws. Over the lakes zoom swallows while owls, hawks and falcons hunt over the rough ground. Gyrfalcons are quite common and one of their favourite perches is on the entrance gate to the lodge where as many as eight have been seen at once.

The shrubs and trees of the river valleys are alive with sparrows and warblers - a frustrating array of flitting "little brown birds" when we were there and all the young were fledged. Above the valleys, a thrush unfamiliar to most Albertans, the attractive Wheatear, may be seen if you are lucky. Along the streams we saw several families of Harlequin Ducks and a Wandering Tattler - a new bird for us - posed on the post of a long-collapsed bridge.

The Mackenzie Barrens plateau is the post-calving feeding ground for large numbers of woodland caribou and, therefore, a prime hunting ground for their predators and the attendant scavengers. From June to October there are always caribou to be seen from the lodge wandering alone or in small groups as they feed. Most of the bulls are in the mountains by mid-summer but a few still join the cows, calves and yearlings on the tundra. It is interesting that in the fall rut, before they migrate south to the forests, these caribou behave like elk with the bulls collecting harems of cows to breed, rather than moving from one oestrous cow to another during migration as do the bulls of the arctic barren-grounds. The Mackenzie caribou are also considerably bigger than their northern relatives and, while hiking in the mountains, we met bulls almost as big as elk.

Many moose are found in the taller scrub and along the valleys but we did not see any out on the tundra. There are no deer or elk in the area, nor are there any mountain goats, but there are plenty of Dall's sheep in the mountains.

Red foxes have been seen but no coyotes. The wolves that we had the thrill of watching were by no means the only pair denning on the edge of the plateau. The

ones we saw were large and dark - the bitch jet black - but many shades, including white, have been recorded. The image of the tremendous power and smooth movement of that male wolf as he pursued the caribou across the rough ground at speeds up to 30 kph will long remain with me.

The year before, people at the lodge had watched a grizzly bear kill a caribou bull after a painstaking two-hour stalk. There are quite a number of grizzlies in the area and, although we did not see any, we saw plenty of signs of their presence. The grizzlies here are small compared to those we see in the Rockies, reaching weights up to 160 kg, about the size of black bears. This is probably because they are only out of dormancy four months of the year. They all dig their dens in the mountainsides rather than finding winter quarters in caves. There are no black bears on the Barrens.

Wolverines are quite often seen in the lovely green valleys high among the mountains and sometimes come onto the plateau to scavenge the kills of wolves and bears. There are lynx in the valley forests, but, apparently, no cougar.

The disturbance of this magnificent wilderness caused by the building of the Canol Road and pipeline is long past, but the mess left behind is still there: tumbledown buildings, rusting trucks, empty oil drums, old pipes and, worst of all, miles of twisted wires to catch the feet and antlers of wandering caribou. And the question remains what, if anything, should be done to protect this unique mountain barrenland? It is certainly worthy of designation as a National Park and the Canol mess would doubtless then be cleaned up. But would the road also be upgraded and the bridges rebuilt to allow access for the many motorhomes, etc., seen touring the roads of Alaska and the Yukon? Perhaps the road could be designated as a 'Heritage trail' with access limited to those on foot or with special permits to use 4-wheel drive vehicles. Pressure on the area to the south has increased in recent years because of the number of people working at mines there and is 'spilling over' onto the plateau. There are, at present, a few outfitters who bring in hunting parties, usually flying them in to lakes further back in the mountains to hunt sheep and caribou bulls. Some hunters take advantage of the lack of restrictions on shooting cows and calves. To stop the hunting would cause much resentment. Then there are the naturalists visiting Oldsquaw Lodge who, between them, are gradually compiling an inventory of the flora and fauna, and a few hardy backpackers exploring hidden pristine valleys. Perhaps it is best to leave well along and not press for any type of formal designation, but one has the uncomfortable feeling that one day some deposits of value to man, such as the tungsten now mined a few kilometers away at Macmillan Pass, might be discovered and the present ecological balance be destroyed. Against that day I feel that it is important for naturalists to know about the area, to help record what is there and to be prepared to defend it against inappropriate use by industry or tourists if necessary.

Not the least of our pleasure when we visited the Mackenzie Barrens was benefitting by the knowledge of Sam Miller, the owner of Oldsquaw Lodge. Sam is a wildlife biologist whose work has included six years spent studying grizzlies of the Mackenzie Mountains. Because of his reports, hunting of these bears has been stopped. He has also worked on Dall's sheep, caribou and gyrfalcons and certainly knows this area better than anyone else.

If this area interests you, you may obtain flora and fauna checklists and information about the lodge from him at Suite 8A, 4078 Fourth Avenue, Whitehorse, Yukon Y1A 4K8. We have already booked to go back again next year!

DOUBLE BROODS OF TREE SWALLOWS IN ONE NEST BOX

by Don Stiles
20 Lake Wapta Rise SE, Calgary, Alberta

One June 13, 1982, while monitoring on the East Didsbury bluebird trail, Philip Stiles, Dan Cloutier and the author discovered a Tree Swallow nest with 12 eggs at house #143 20 miles (32 km) east of Didsbury. The eggs were clean and fresh-looking and the nest was active with an adult brooding, which was banded. On previous occasions where large numbers of Tree Swallow eggs were found, the nest was unmade, the eggs were dirty and no subsequent hatchings occurred. In this case, on the next monitoring, July 1, there were 12 healthy young, all of which we banded. Two days later, they were photographed, and a decision to leave all 12 in the nest and not move some to nearby boxes as they seemed to be folding themselves over one another to avoid taking up the whole box. A final check on July 20 suggested all had fledged successfully. Three adults flying around the nest on June 13 and July 1, and five adults flying around on July 3 lead us to believe it was a multiple effort which fledged the 12 Tree Swallows in one box.

At the September meeting of the Federation of Alberta Naturalists, conversation with Grace Neill of Stettler revealed that she, too, had found a similar situation. She has just a few boxes around her farm, four miles south of Stettler. When Tree Swallows took possession of house #7, several birds were seen flying around it. The first egg was found on May 15. On May 30 there were 13 eggs with two hens brooding them. Both hens flew. On June 12th, one hen flew out as Grace looked in. She lifted the other one, counted the eggs, and put the second hen back down on the eggs. The bird stayed there. On June 15th, Lloyd Lohr joined Grace to check the nest. They found the eggs were hatching. Lloyd noted then that there was only one male bird near, and concluded that might indicate a case of polygamy. A few days later, Grace removed three infertile eggs from the nest and then left the ten young birds alone for quite some time. When she next checked the house, there were the remains of two nearly fully-grown birds, but Grace assumed the rest had fledged.

Further inquiries revealed that Blake Stillings of Calgary encountered a case in 1978, the first year he started his bluebird trail, where 9 Tree Swallows had fledged. There were 9 eggs in the nest, two hens were brooding the eggs, and one male was nearby, suggesting polygamy. Although Blake has built his trail to over 300 boxes, a similar situation hasn't occurred since that time.

The author would be interested in learning if others have run across similar double brood situations or possible polygamous situations in Tree Swallows.

OVERHEARD. . .

"Decisions to use pesticides are usually made by knowledgeable people who assess the benefits and risks. If for no other reason than economic, these decisions are not taken lightly."

F.L. McEwen addressing Can. Agricultural Chemicals Assoc., Ottawa, October 1981 from Farm Light & Power

ROADSIDE LIFE: LAST REFUGE FOR PRAIRIE FLORA & FAUNA?

by Louise Horstman

The land on either side of Alberta's 136,000 km of road does not usually enter into a discussion of public land, but this real estate - variously referred to as road allowance, roadside, road verge or right-of-way - amounts to about 180,000 hectares of provincial Crown land.

To the urbanite out for a drive, the road allowance is no-man's-land, a still life of ditch, grass, trees and beer bottles.

To the daily user of the road, the farmer, the road allowance is the receiver or snow from the road, the carrier of spring runoff, bearer of utility lines and a potential source of weeds. If trees on the roadside slow the movement of snow, drifts may build and spread across his road. If the ditch is overgrown or plugged by debris or beaver dams, his land may flood. If trees rub or fall against the utility lines, he may suffer loss of power or telephone. And if weeds go to seed in the ditch, they will surely spread to the fields.

The vast majority of Alberta roads are just graded or gravelled. Most rural roads and their allowances are now constructed to be 30 metres wide; in the past most were about 22 metres, including the roadsides.

With the older roads, a narrow, steep-sided ditch was dug alongside the road and the rest of the land was flattened back to the property line. Newer roads have been built with gently sloping ditches occupying the entire road allowance.

Management of weeds on the road allowance is the responsibility of municipalities in counties and municipal districts (MDs). The Weed Control Act of 1979 obliges municipalities to destroy restricted and noxious weeds, as defined in the Act, along roadsides. In irrigation districts this responsibility is assumed by Alberta Transportation which holds title to road allowances in all municipalities. More specifically, the responsibility rests upon the shoulders of the three to five-member agricultural service board, which is composed of municipal councillors and ratepayers of the municipality. The agricultural fieldman is hired by the board to carry out its programs and decisions.

Most agricultural service boards conduct herbicide spraying programs, with the exception of some in the southern prairies, where grass is the climax vegetation. Herbaceous (non-woody) plants, shrubs and trees are all destroyed, preferably in one pass-by, in order to keep roadsides open for snow removal, utility line protection, traffic visibility and noxious weed control.

Until a few years ago, a combination of 2,4-D and 2,4,5-T was commonly employed for this multipurpose elimination. But due primarily to the association of these chemicals with Agent Orange in the public's mind, a different chemical, picloram (Tordon) is now generally used. Like the combination herbicides preceding it, picloram destroys almost all vegetation other than grasses and cattails. It has moderately long-lived activity, necessitating respraying only once in about three years.

The grass resulting from this treatment may be used by farmers who wish to mow it where ditches are gently sloped. A program to backslope the old, steep ditches is

also underway but proceeding at a snails pace due to the high cost of bulldozing.

This regime has its problems, as Keith Price, head of the weed control and field services branch of Alberta Agriculture, readily states. Some farmers feel mowing the roadside is not worth the risk of losing an expensive tractor tire to a beer bottle. And spraying, particularly of picloram, is expensive. Also, the chemical has been detected in some water and mud samples of sloughs near roadsides; whether this is due to improper spraying of the sloughs themselves or accumulation from ditch runoff water is not yet known. Alberta Agriculture and Alberta Environment are launching an educational program for part-time summer pesticide applicators as a result. Also, gardeners will have to be advised of the danger of using water from ditches and sloughs.

The greening of Alberta's roadsides is decried by Pat Seymour, head of the U. of A.'s botanical garden at Devon. Roadsides and railway right-of-way are the last refuge of some wildflower species in Alberta, he explains, and blanket spraying of these areas has pushed some, including the yellow lady slipper orchid, the low prairie rose (*Rose arkansana*) and the glacier lily to the brink of extinction. Even the common wild rose, our provincial emblem, is much less visible these days. The prairie lily, once creating a mass of bright orange along roads in Alberta, is now found only on unsprayed areas. These native roadside inhabitants were not only tourist attractions, Seymour adds, but the seed source of many of our garden varieties and, in some cases, of potential commercial importance. Seymour deplores blanket spraying as irresponsible and unnecessary.

Wildlife enthusiasts are not in favor of unlimited grass on the roadsides, either. Shrubs and herbaceous plants - some of them "weeds" to the farmer, but not necessarily of the highly spreading, noxious kind - support a variety of birds and mammals. Berries and weed seeds are fed upon by Hungarian Partridge, Ruffed Grouse, and numerous songbird species, while the sturdy sweet clover shelters pheasants in winter. . .The Fish and Wildlife Division has for years urged retention of wildlife habitat where possible along roads, but, according to Dave Neave, head of the habitat section, their recommendations, adopted at interdepartmental referral meetings, have seldom been put into practice. It's not that roadsides are the ideal place for wildlife - animals do run onto the road - but in some areas of the province this is the only wildlife habitat left.

The Wisconsin Department of Natural Resources decided to test the feasibility of maintaining shrubs and herbaceous vegetation without sacrificing road safety, snow removal and utility line maintenance. Along 24 km of 6.6-metre wide rural roadsides in the central part of the state the Department removed trees, shrugs growing too close to the road and noxious weeds by handcutting and spot spraying. No planting was carried out. After 10-15 years, a considerable amount of shrub cover developed, and the rate of change of the species present slowed. Completed in 1977, the 18-year study concluded: "The results of this study further reinforce the justification for maintaining existing natural shrubby roadsides as a means of preserving and enhancing environmental quality. Such justification is particularly important at a time when mowing and debrushing are costly users of energy."

While this approach may not soon be taken in Alberta, increased flexibility may be on the way.

For instance, under the Weed Control Act, municipalities may pass the onus for control of roadside noxious weeds to the owner of adjoining land. Failure of the landowner to control these weeds will still elicit the enforcement capability of the Weed Control Act. According to Price, the weed control section of Alberta

Agriculture neither opposes nor fosters this approach, but is willing to see the responsibility passed to landowners who wish to assume it as an alternative to having their portion of the road allowance sprayed. In fact, the weed control section has had bright orange signs printed for these people to post in order to avoid having their roadside sprayed.

Some agricultural fieldmen are eyeing a new type of roadside mower which possesses great versatility. Its hydraulically operated boom-type arm can extend the entire width of the right-of-way or pivot at one of several points to fit any shape of ditch. The head holds two rotary blades capable of cutting trees and brush up to about 10 cm in diameter. Cutting height can be set to any level, thus sparing low-growing legumes and wildflowers if desired. However, municipal budgets are hard-pressed to meet the $30,000 price tag.

Selective chemical "mowing" is also possible by means of machines which apply a strip of whatever chemical is desired at a selected height. This method is less effective than spraying.

The herbicides most commonly used destroy all broad-leafed species, leaving only grasses. More selective chemicals are available, however. Choosing herbicides which would spare nitrogen-fixing legumes (alfalfa, peavine, clover, etc.) would have the added benefit of improving the soil along the roadsides, which is in many cases clay with little topsoil.

Many agriculturists feel that spot rather than blanket spraying would be enough, particularly in some areas. If herbicide prices keep rising, this will become an even more attractive alternative.

- A Reprint from "Environment Views", an independently-directed publication of Alberta Environment, by permission of M. Vicars, Editor

HOARY BAT SIGHTING

by Jim Lange
10519 128 Ave., Edmonton, AB T5E 0J2

While walking in the area near Westlock, Alberta, at approximately 3 pm, I saw what appeared to be a bird fluttering on the top wire of a barbwire fence. Upon closer examination, it turned out to be a large bat. This bat was silver gray on the body, had a brown head and large, round ears, very long dark brown-black wings with a white spot in the wrist area. Each wing was approximately 8" long.

This sighting was in the vicinity of our farm located 5 miles west and 4-1/2 miles north of the town of Westlock on August 29, 1982. The weather was sunny and warm with a light breeze. The habitat was open farmland seeded to crop, with a narrow strip of pasture along one edge. The pasture land borders a small slough

surrounded by mature aspen trees.

The bat apparently had just skimmed over the top wire and caught the skin on the tail end of the body on the barbs. The bat was impaled by two barbs going in opposite directions.

Several photographs were taken before trying to release the bat. When pulled free, the bat flew off toward the aspens, which it flew parallel to for a short distance at about 6' above the ground. The bat then caught the wind and disappeared up into the trees. It was not seen again, but appeared unhampered by the injuries received.

RECENT PUBLICATIONS ON THE NATURAL HISTORY OF ALBERTA

Compiled by David M. Ealey and Martin K. McNicholl

A.O.U. Committee on Classification and Nomenclature. 1982. Thirty-fourth Supplement to the American Ornithologists' Union check-list of North American birds. Auk 99, suppl.: 1CC-16CC.

Anonymous. 1979. Latest rumors. Continental Birdlife 1: 83-84. - includes Alberta nesting of Mountain plovers.

Anonymous. 1979. Latest rumors. Continental Birdlife 1: 83-84. - retracts earlier report of Gray-headed Chickadee in Alberta.

Anonymous. 1982. Sightings. Edmonton Bird Club Newsletter Sept. 1982: 3.

Armstrong, J. 1982. Badlands are good. Alta. Mag. 3(4): 14-15, 17.

Bird, C.D., G.J. Hilchie, N.G. Kondla, W.W. Smith, E. Kuyt, J.K. Ryan and T.W. Thormin. 1982. Butterflies of northeastern Alberta. Blue Jay 40: 141-152.

Boag, D.A. 1982. Overcoming sampling bias in studies of terrestrial gastrapods. Can. J. Zool. 60: 1289-1292.

Boag, D.A. 1982. How dominance status of adult Japanese Quail influences the viability and dominance status of their offspring. Can. J. Zool. 60: 1885-1891.

Boxall, P.C. and M.R. Lein. 1982. Feeding ecology of Snowy Owls (Nyctea scandiaca) wintering in southern Alberta. Arctic 35: 282-290.

Boxall, P.C. and P.H.R. Stepney. 1982. The distribution and status of the Barred Owl in Alberta. Can. Field-Nat. 96: 46-50.

Buhrmann, H. and D. Young. 1982. Canoeing southern Alberta. Explore, 6: 32-36.

Bullock, R.E. 1982. An analysis of locomotor body movements in Pronghorn Antelope. Can. J. Zool. 60: 1871-1880.

Collister, D. 1982. Bird highlights: Calgary, July 1982. Calgary Field Nat. Newsl. 4(1): 2.

Collister, D. 1982. Bird highlights: Calgary, August 1982. Calgary Field Nat. Newsl. 4(2): 2.

Craden, D.M. 1982. The Brazeau Lake slide, Jasper National Park, Alberta. Can. J. Earth Sci. 19(5): 975-981.

Culp, J.M. and R.W. Davies. 1982. Analysis of longitudinal zonation and the river continuum concept in the Oldman-South Saskatchewan River system. Can. J. Fisheries and Aquatic Sci. 39(9): 1258-1266.

Dekker, D. 1982. This lake is for the birds. Nature Can. 11(3): 17-21.

Dickson, Dorothy. 1982. Wildlife in the Rockies. G.B. Publishing, Calgary. 80 pp.

Ebel, R. 1982. The eighty-second Audubon Christmas bird count. 139. Wabamun Lake, Alta. Amer. Birds 36: 431.

Ewan, J. and N.D. Ewan. 1981. Biographical dictionary of Rocky Mountain naturalists. Bohn, Schelton & Halkenup, Utrecht/Antwerp & Dr. W. Junck, The Hague/Boston. xvi + 253 pp.

Ferguson, M.A.D. and L.B. Keith. 1982. Influence of nordic skiing on distribution of Moose and Elk in Elk Island National Park, Alberta. Can. Field-Nat. 96: 69-78.

Gilbert, F.F. and E.G. Naucekivell. 1982. Food habits of Mink (Mustella vison) and Otter (Lutra canadensis) in northeastern Alberta. Can. J. Zool. 60: 1282-1288.

Ginnis, J. 1982. The wood-inhabiting fungus Aleurodiscus dendroidens sp. nov., and the distinctions between A. grantii and A. amorphus. Can. Field-Nat. 96: 131-138.

Gollop, J.B. 1982. The winter season. December 1, 1981 - February 28, 1982. Prairie provinces region. Amer. Birds 36: 304-305.

Griffin, D. 1982. Clifford E. Lee Nature Sanctuary. A co-operative wildlife program. pp. 77-78 in Canadian Wildlife Administration June 1982 for 46th Fed.-Prov. Wildl. Conf.

Gulley, J. 1982. The eighty-second Audubon Christmas bird count. 134. Fort McMurray, Alta. Amer. Birds 36: 430.

Halladay, I. 1982. The eighty-second Audubon Christmas bird count, 131. Calgary, Alta. Amer. Birds 36: 429-430.

Harris, S.A. and L. Hubricht. 1982. Distribution of the species of the genus Oxyloma (Mollusca, Succineidae) in southern Canada and the adjacent portions of the United States. Can. J. Zool. 60: 1607-1611.

Holmes, N.D. 1982. Population dynamics of the wheat stem sawfly, Cephus cinctus (Hymenoptera: Cephidae) in wheat. Can. Ent. 114: 775-788.

Holroyd, G. 1982. The eighty-second Aubudon Christmas Bird count. 129. Banff-Canmore, Alta. Amer. Birds 36: 429.

Houston, C.S. and M.J. Bechard. 1982. Oology on the northern plains: an historical review. Blue Jay 40: 154-157.

Johnston, S. 1982. The eighty-second Audubon Christmas bird count. 138. The Snakes Head, Alta. Amer. Birds 36: 430-431.

Kennedy, A.J. 1982. The majestic moose. Explore 6: 46-50.

Kuijt, Job. 1981. A flora of Waterton Lakes National Park. Edmonton, Univer. of Alta. Press. 700 pp.

Lane, N., D.J. Mackintosh and D. Stiles. 1982. Canadian nestbox report, 1981. Sialia 4: 95-96.

Lein, M.R. and G.M. Wagner. 1982. First breeding record for the Nashville Warbler, Vermivora ruficapilla, in Alberta. Can. Field-Nat. 96: 88-89.

Lohr, L. 1982. The eighty-second Audubon Christmas bird count. 133. Erskine, Alta. Amer. Birds 36: 430.

Lohr, L. 1982. The eighty-second Audubon Christmas bird count. 137. Stettler, Alta. Amer. Birds 36: 430.

McIvor, M. 1982. The eighty-second Audubon Christmas bird count. 130. Bow Summit, Alta. Amer. Birds 36: 429.

Moyles, D.L.J. 1982. Alberta. Alberta's pheasant raise-and-release program. pp. 63-64 in Canadian Wildlife Administration June 1982 for 46th Fed.-Prov. Wildl. Conf.

Podlubny, J. 1982. The eighty-second Audubon Christmas bird count. 140. Wildlife Reserve of Western Canada. Amer. Birds 36: 431.

Rebollar, C.J., E.R. Kanasewich and E. Nyland. 1982. Source parameters from shallow events in the Rocky Mountain House earthquake swarm. Can. J. Earth Sci. 19(5): 907-918.

Shaw, J. 1982. Melt-out till in the Edmonton area, Alberta, Canada. Can. J. Earth Sci. 19(8): 1548-1569.

Smith, H.C. 1982. An albino Little Brown Bat, Myotis lucifugus, from Alberta. Can. Field-Nat. 96(2): 217.

Smith, I.M. 1982. Larvae of water mites of the genera of the superfamily Lebertioidea (Prostigmata: Parasitengony) in North America with comments on phytogeny and higher classification of the superfamily. Can. Ent. 114(10): 901-990.

Soper, J.H. and E.L. Housfield. 1982. A tribute to William Kirven Willcock Baldwin. M.B.E. (1910-1979). Can. Field-Nat. 96: 92-97.

Storms, R. 1982. The eighty-second Audubon Christmas bird count. 135. Horseshoe Canyon, Alberta. Amer. Birds 36: 430.

Telfer, E.S. 1982. Co-operative research. The Parks Canada-Canadian Wildlife Service western and northern region experience. pp. 17-23 in Canadian Wildlife Administration June 1982 for 46th Fed.-Prov. Wildl. Conf.

Thomas, J.W. and D.E. Toweill (eds.) 1982. Elk of North America: ecology and management. Wildlife Mgmt. Institute, Washington, D.C. 720 pp.

Thompson, R.L. and J.C. Turner. 1982. Temporal geographic variation in the lambing season of Bighorn Sheep. Can. J. Zool. 60: 1781-1793.

Thormin, T.W. 1982. The eighty-second Audubon Christmas bird count. 132. Edmonton, Alta. Amer. Birds 36: 430.

Truch, P. 1982. Alberta's big rock. Alta. Mag. 3(3): 21-23.

Weber, W.C. 1982. The eighty-second Audubon Christmas Bird Count, Western and Northern Canada. Amer. Birds 36(4): 376-378.

Wilkinson, P.R., H.R.Abbott and J.N. Willman. 1982. Location of larvae of the winter tick, Dermacentor albipictus (Pack.) in Elk Island National Park, Alberta. Can. Field-Nat. 96(2): 211-213.

Zammuto, R. 1982. The eighty-second Audubon Christmas bird count. 136. Kananaskis Valley, Alta. Amer. Birds 36: 430.

NATURALISTS' BOOKSHELF

CARIBOU AND THE BARREN LANDS

by George Calef. 1981. Canadian Arctic Resources Committee, 46 Elgin St., Ottawa, K1P 5K6. 176 pp. $34.95, hardcover, plus $1.25 postage and handling.

Part I of this book describes events in the life cycle of barren-ground caribou over a typical year, by season from spring migration to winter. In each chapter the author employs a semi-fictionalized, often lyrical, narrative to provide a graphic picture of typical events followed by a synthesis of current understanding of caribou biology based on his own observations, observations of other biologists and the scientific literature. A plethora of colour photographs, 116 in all, are interspersed throughout the text. The photographs range from good to exquisite. They complement the text in portraying the events and behaviours described. No other publication on caribou provides such a diverse or complete pictorial on various aspects of caribou biology. The quality of the graphic reproduction and format of the book are excellent.

This, however, is not just another pretty coffee-table picture book. The text is substantive and biologically accurate. The narrative followed by a more technical synthesis - a tricky approach - has been skillfully done. It allows the author latitude to convey his verbal images of the caribou and their vast environment on the one hand with an informative summary of caribou ecology on the other. This will appeal to a wide range of readers, including youngsters who will find the narrative and pictures alone to be appealing even though they may not be inclined or ready for the more technical discussion.

The text is further supplemented by a series of six maps, five of which represent movements or distribution of representative herds for the season under discussion. The maps help to orient the reader to the numerous geographic place names used in the text but do not provide a complete summary of the annual distribution of each herd.

Starting with spring migration to calving grounds, the author discusses various aspects of caribou biology and behaviour, following them through calving, post-calving and summer movements in June and July, the dispersal over summer ranges in August, the fall migration and rutting period and subsequent movements to winter ranges in the forested taiga. Factors affecting their movements and behaviour are discussed throughout as appropriate. The intimate relationship between wolves and caribou is treated well. Obstacles encountered by caribou, survival imperatives, sources of mortality from wolves and hunting are also dealt with. The author highlights the many behavioural and physiological adaptations of caribou to an environment dominated by snow and intense cold for much of their life. He also discusses the influence of insect harassment during the brief Arctic summer on caribou movements and behaviour - a topic not often appreciated by those unfamiliar with caribou.

In a book of this nature, some statements will appear somewhat dogmatic to the informed reader, either because they are speculative or because they extrapolate observations into generalizations which may not be warranted. For example,

the statement is made in reference to movement through snow (p. 40) that, "They move in single file, each animal stepping in the tracks of the one before it." While this may sometimes be true, it is not a literal nor general mode of travel. The author asks (p. 40) if, during migration, group leaders change if different routes are used. However, he later points out when discussing the spring migration of the Bathurst herd that changes in leadership are common, even on the same routes.

An inconsistency appears during discussions of the autumn movements where winter ranges are characterized as being traditional and relatively predictable. Most caribou biologists would disagree with this assertion since winter ranges may vary drastically over the tens of thousands of square kilometers which may be used at one time or another. Winter distribution is one of the most unpredictable elements of the annual cycle. This is later acknowledged in the chapter entitled "Winter The Time of Testing" where distributions are described as varying considerably from winter to winter.

The example given of range use by the Central Arctic herd in northern Alaska is in error. It refers to the use of forested river valleys. The Central Arctic herd ranges north of the continental divide of the Brooks Range in Alaska (Cameron, R.D. and K.R. Whitten. 1976. First interim report of the effects of the Trans-Alaska Pipeline on caribou movements. Spec. Rep. No. 2. Joint State/Federal Fish and Wildlife Advisory Team, Anchorage, Alaska. 53 pp.). Forested valleys occur south of the continental divide. The Central Arctic herd is an example of a year round tundra dwelling herd.

Part II discusses the major factors which influence the numbers and status of the great caribou herds; human kill and wolf predation. The research legacy of Dr. Tom Bergerud, who is graciously acknowledged in the author's preface, is particularly evident here. This section deals rationally and sympathetically with the conundrum of human over-harvest and wolf predation and the pressing need to control one or the other or both if the major herds are to survive in numbers of the recent past. The example of the Alaska experience provided is useful and directly applicable to caribou concerns in Northern Canada. The author sidesteps the issue of the occasional profligate misuse of caribou by northern native people, in particular the wanton waste associated with slaughter of the Bathurst herd in the winter of 1974-75 and of the Beverly herd in the winter of 1978-79 when 20,000 or more animals were killed in the Beverly herd alone. The impact of northern industrial development on caribou to date is placed in an objective light, and is considered by the author to be minor.

In dealing with the topic of harassment the author states, "Nor can the harassment of caribou with vehicles - including aircraft - be permitted." Yet on page 42 there is a photograph of a group of pregnant cows in shoulder-deep snow under extreme duress. This photo could only have been taken from a helicopter. Two other close-up photos of hard-running caribou look as if they were taken from aircraft.

For the serious reader a brief review of literature on major topics is provided in conjunction with the selected bibliography.

The author's analysis of pressing needs to maintain this northern heritage will receive nods of concurrence from most biologists. It deserves the thoughtful consideration and support of all Canadians.

At $34.95 plus shipping, "Caribou and the Barren Lands" is relatively expensive but worth the price. It is well written and researched and will hold the interest of a wide array of readers. The photographs and text combine to present a comprehensive and accurate glimpse into the world and the majesty of barren-ground caribou.

- R.D. Jakimchuk

CANADA/A LANDSCAPE PORTRAIT

J.A. Kraulis (Ed.). 1982. Foreward by Robert Fulford. 127pp. 95 photographs. Hurtig Publishers Ltd., Edmonton, Alberta. $27.50

"Canada A Landscape Portrait" begins with an excellent, thought-provoking 7-page foreward written by Robert Fulford, *'Canada's most respected critic and commentator on the Canadian scene."* It begins, *"History strives earnestly to teach us its enduring lessons, but in Canada geography is our real teacher, the one to which we must listen with the greatest care. . . The history of our culture is the history of our attempt to come to terms imaginatively with the variety and vastness of the Canadian landscape. . ."* Fulford goes on to say that *"Plutarch says of the geographers of the ancient world that they would 'crowd into the edges of their maps parts of the world which they do not know about, adding notes in the margin to the effect that beyond this lies nothing but sandy deserts full of wild beasts, and unapproachable bogs'. In the mind of the modern Canadian, the map of his own country has many such edges, each of them filled with images (accumulated since childhood) of vast empty wastelands beyond the horizon, uninhabited and therefore uninhabitable. . . Before we can finally take Canada into our minds we need to experience it through art; in effect, artists must invent it for us."* That is precisely what this book, through the art of photography, is all about.

The foreward is followed by a 4-page Introduction by J.A. Kraulis, noted photographer and Editor of "Canada A Landscape Portrait", The Introduction is an interesting discussion of photography as an art form.

The book features 95 photographs by 42 photographers. The photos are not high gloss, but the quality of reproduction is very good. Of the 95 photos, 12 are black-and-white, five of which were notable but 7 of which were rather unexceptionable.

The choice of photographs represents a very good balance of Canadian landscape with some refreshing insights and new perspectives. Among all the photos, there was not one single stale landscape we've all come to associate with "Canada" - no Lake Louise, Columbia Icefields or Bow Falls shots! For example, instead of the standard "Peggy's Cove" cliche, we are treated to an interesting, artful "Frost-split glacial erratic, Peggy's Cove, Nova Scotia", by Victor Killing. My only personal complaint regarding the selection of photographs was the relative lack of winter landscapes - fewer than 20. Given Canada's geography, winter undeniably makes up a substantial part of the landscape, and perhaps winter landscapes might have been given more prominence to provide a more genuine "landscape portrait of Canada".

The book concludes with insightful comments from or about each of the photographers regarding their particular approaches to their art and, in quite a few instances, the circumstances in which the photographs featured in the book were taken. As an amateur photographer, I found this portion of the book exceptionally interesting.

"Canada A Landscape Portrait" is an attractive, coffee-table book highlighted by exceptional text. It is not the most spectacular collection of photographs I've ever seen, but it is certainly one of the more imaginative and engaging.

- Virginia Young

AMPHIBIANS OF CANADA

by Barbara Froom. 1981. 120 pp., illustrated. McClelland and Stewart Ltd., $12.95 paperback.

"Amphibians of Canada" is the third and most recent book written by Barbara Froom dealing with herptiles (amphibians and reptiles) in Canada. In each of the books the author strives to increase the reader's awareness of the diversity of these often inconspicuous animals, their ecological importance, their struggle for survival, and the need to learn more about them.

In the foreward she describes her early encounters with amphibians. It can be seen that she has a deep-rooted compassion for living things and a history of firsthand experience with a variety of amphibians.

The introduction deals with amphibians in a general sense and provides a preview of the general manner in which families and species are dealt with in the remainder of the book. The author makes it clear that the book uses selected examples occurring in Canada and does not pretend to be a comprehensive volume dealing with all Canadian species of amphibians.

The first chapter provides a simplified (thus very readable) discussion of amphibian origins and early history. The second chapter discusses the role of amphibians in the folklore of people in many lands and a number of myths are dispelled. Chapter three describes the physical characteristics and adaptations of amphibians. Numerous exceptions to the so-called "normal" amphibian life cycle are pointed out. The author discusses the powers of regeneration possessed by amphibians as well as their role in cloning experiments.

The fourth chapter explains in an easily-readable fashion the complex topic of classification. She includes a list compiled by Dr. Francis Cook, Curator of Herpetology, National Museums of Canada of the scientific and common names of all the amphibian species native to Canada. The standardization of names of living things is an important aid in communicating knowledge about each species. The inclusion of this list should promote more widespread use of Dr. Cook's well-considered common names first published in 1980. The list is somewhat confusing as published in the book as the author neglected to write out the full scientific name where trinomials are used to name well defined subspecies. It is fortuitous that for the first six species for which trinomials are employed the name of the subspecies is the same as that of the species.

Necturus m. maculosus should, however, be fully written out as *Necturus maculosus maculosus* the first time it is used. Later in the list *Desmognathus p. fuscus* appears. In this instance *p.* is a typographical error. The full trinomial is *Desmognathus fuscus fuscus*. *Acris c. blanchardi* should be first written out as *Acris crepitans blanchardi* and *Rana c. melanota* as *Rana clamitans melanota*. The last species might be mistaken for a subspecies of *Rana catesbeiana* the way the list is written in the book.

Species accounts for representative salamanders, toads and frogs are given in chapters five, six and seven respectively. The examples are well-chosen and include both eastern and western Canadian species as well as widespread species. The variability in the life histories of the Tiger Salamander might have been dealt with at greater length as it is the most widespread and variable of Canadian salamanders. There is an apparent contradiction regarding the status of the eastern "subspecies". This may arise from the fact that the subspecies of Tiger Salamanders (and indeed many organisms) are not necessarily well-defined.

The Tailed Frog is reported to occur in Alberta on what the author now knows was erroneous information. That this record is included in the text is an editing oversight. While suitable habitat exists in some east slope streams, the continental divide may be an insurmountable barrier to the spread of the distribution of this species into Alberta. The name of the Northern Spring Salamander *Gyrinophilus* is misspelled in the species account.

A slight eastern bias is evident in the statement that the Wood Frog 'jumps farther than most'. Western and northern populations are shorter-legged than in the east and move by short hops as opposed to the longer leaps of eastern Wood Frogs and the Northern Leopard Frog. Although concerned throughout the book with the welfare of small or declining numbers of some species, the author was unaware of the recent dramatic decline of the Northern Leopard Frog in Alberta.

Aside from the oversight mentioned above, the species accounts provide an adequate amount of information about the various species and permit the reader to develop some appreciation of the needs and problems associated with the daily, seasonal and long-term existence of each species. The text is complemented by excellent drawings, black-and-white and colour photographs.

The eighth chapter dealing with amphibians as pets if particularly informative. It is based in large part on the author's personal experience and written with the well-being of pets the primary consideration.

The book closes with a timely and thoughtful discussion of conservation. Amphibians of Canada is well-written, easy to read and digest, informative, and conveys not only information about amphibians but instills in the reader feeling for these interesting denizens of our country. It is an excellent introduction to the natural history of Canadian amphibians.

- W. Roberts, Dept. Zoology, U. of A.

THE ART OF CANADIAN NATURE PHOTOGRAPHY

Janis Kraulis, Editor. 1980. Hurtig Publishers, Edmonton, Alberta. 128 pp. $27.50 hardcover.

Having just captured a dramatic photograph of the ominous grizzly bear, a budding photographer excitedly relates his experience to a naturalist. The naturalist frowns briefly thinking of the possible fate of the bear had the photographer been attacked in his bid for the photo. The naturalist turns away as a smile comes across his face as he remembers his first such encounter.

It's hard to find a naturalist who hasn't felt the urge to record the natural world on film. Conversely, it's hard to find a photographer whose interest in nature hasn't grown as a result of an interest in photography.

In "The Art of Canadian Nature Photography" Janis Kraulis has found a niche that should inspire photographers and naturalists alike. First glance told me this was just another coffee-table book, made to sell to people looking for a retirement gift. The usual shortfall of coffee-table books is that awe-inspiring photographs are often accompanied by a text that could put sleeping pill manufacturers out of business.

The text is an anthology of the works, thoughts and motivations of 37 photographers from Pat Morrow of Mount Everest fame to the works of those making their publishing debut in this book.

Janis Kraulis relates each photographer's story in third person, using quotes to back particularly interesting facets of their varied styles and motivations. Kraulis effectively reveals the photographer's artistry through intimate passages describing the story behind the picture.

Leaving the technical jargon behind, Kraulis gives an account of the circumstances which inspired the photo, adding the focal length of the lens but not the exposure detail which, for the most part, is useless anyway.

There is a photograph is a grizzly shaking water off his fur after diving after Pacific salmon. Brian Milnes, the photographer, packs no gun believing the bears have no malice, just a desire to defend their territory. Standing in the middle of a remote west coast river, Milne recorded the photo using a tripod and a 300 mm lens to give the viewer the bear's perspective. From the romantic to Vancouver's Stanley Park, Wayne Lankinen relates his story of how the waterfowl endure screaming kids and cyclists. Yet, the 'tranquil waters erupted' at the sight of him and his tripod, which he thought may have appeared like a shotgun to the birds. The picture he captured was a male Wood Duck, a dramatic photo, taken in the heart of one of Canada's largest cities.

The range of situations and skills represented between the covers of the book serves to give a readable, well-rounded glimpse into nature photography from a naturalist's point of view. The broad range of interests should inspire anyone to acquire new insight into acquiring new insight into appreciating the works of Canada's nature photographers.

Kraulis' book lacks some of the polish of a National Geographic publication. Yet, this serves to benefit the text as a whole. While some photographs require days and thousands of dollars worth of equipment to record, the emphasis remains on outstanding nature photos made with as little equipment dependence as possible. From elaborate excursions into the Arctic to Egon Bork's livingroom window where he recorded an interesting frost pattern, the book has a universal appeal. It includes simple home photo ideas and awe-inspiring photos that supply a much-needed inspiration for the photographer who feels burned-out.

The natural history descriptions range from inadequate to those that come from well-researched naturalists. Some of the photos were poor in my original estimation but the story behind the photo many times showed how blind I was in my initial reaction. It seems every naturalist/photographer has a set of preconceived ideas regarding what makes a good picture thereby limiting the possibility. The descriptions open new doors to everyone. Photography is seeing or learning to see. By learning what others saw at the moment, the photo captured is refreshing. A method of improving one's own skills involves borrowing ideas from others and expanding on the idea. While it is often easy to criticize other's work, the challenge is to better the end result.

Photography is a common ground for almost everyone, and the best part of the hobby/profession is sharing the experience with others. Janis Kraulis achieves this in"The Art of Canadian Nature Photography"in a very personal manner.

- Dave Dodge, Photojournalist
The Sturgeon Gazette, St. Albert, Alta.

OTHER PUBLICATIONS OF INTEREST

"A Guide to Appearing Before the Surface Rights Board of Alberta. Working Paper 1." August 1982, by Laureen D. Ridsdel and Richard J. Bennett. 70 pp. Available from: Canadian Institute of Resources Law, Faculty of Law, Bio. Science 430, University of Calgary, Calgary AB T2N 1N4. $5.00 + .50 postage and handling. *"This booklet provides a guide for landowners and occupants, companies, lawyers and other professionals appearing before the Surface Rights Board of Alberta. Although it includes some legal analysis, the booklet is designed primarily as a 'how to' guide to the preparation and presentation of a case to the SRB. It has therefore been designed to serve both the legally and (perhaps especially) the non-legally trained person."*

"Global 2000: Implications for Canada" by G.O. Barney, P.H. Freeman and C.A. Ulinski. Presents a thorough examination of trends that will affect Canadians in the next two decades. Canada, although richly endowed with natural resources, will nevertheless have to face the serious world problems of resource depletion, population growth and economic disparities that lead to poverty, inequity, social turmoil and widespread conflict. Commissioned at the initiative of Environment Canada and sponsored by the Canadian Association for the Club of Rome. New from Pergamon Press, 150 Consumers Road, Willowdale, Ont. M2J 1P9. Paperback, $13.50, hardcover $40.00.

"Nature with Children of All Ages: Activities and Adventures for Exploring, Learning and Enjoying the World Around Us" by Edith Sesson. The Massachusetts Audubon Society. Spectrum Books, Prentice-Hall, Englewood Cliffs, New Jersey 07632.

"A Bird-Finding Guide to Ontario" by Clive E. Goodwin. 1982. University of Toronto Press. $12.50 paperback. [A review of this will appear in the next issue of the AN].

"Nature Drawing: A Tool for Learning" by Clare Walker Leslie. 1980. Spectrum Books, Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632. $9.95 paperback. [A review of this book will appear in the next issue of the AN - ed.]

OVERHEARD. . .

"Man has a separate place in Nature. He is a separate, but fatally involved being. Ever since he was kicked out of Eden, he has tried to get back in, but he cannot. He cannot communicate with Nature on a conscious level and he is only partially successful when he tries to commune on an elemental level. Man is both protector and destroyer, but he must be more lover than enemy to nature, for if nature is disrupted and destroyed, then man will die too, perhaps for lack of the smallest of necessary things."

Submitted by Murray A. Tozer, from "Slivers of Glass" by W.A. Pedersen

J. DEWEY SOPER - NATURALIST-EXPLORER, 1893 - 1982

The recent passing of Dr. J. Dewey Soper marks the end of an era. On November 2, 1982, Dewey Soper completed a life of exploration and natural history studies that was 89 years long. During that time, he travelled thousands of kilometres in the Canadian Arctic Archipelago while conducting expeditions for the federal Department of Mines and Resources. The Dewey Soper Bird Sanctuary in southwestern Baffin Island, was established to acknowledge Dr. Soper's discovery of the nesting grounds of the blue goose, a colour phase of the Snow Goose.

In Alberta, Soper's primary contribution to natural history came after he had retired from federal service. He was made an honorary research associate at the University of Alberta in 1961 and subsequently conducted studies of mammals and birds throughout the province. The Mammals of Alberta, which he published in 1964, remains as the authoritative guide to mammals in Alberta. This, along with his studies of flora and fauna in the western national parks, advanced the study of natural history in Alberta to a considerable extent.

In 1971, Dr. Soper accepted the invitation of the directors of the Federation of Alberta Naturalists to be F.A.N.'s first Honorary Member. Other naturalists have honored him. In 1980, he was presented with the Douglas H. Pimlott Conservation Award by the Canadian Nature Federation. Dewey Soper's accomplishments, including the writing of over 130 articles, papers, and books, have provided inspiration and enjoyment for many of Alberta's naturalists.

-David M. Ealey

FAN NEWS

FAN ANNUAL GENERAL MEETING - 1983

FAN's Annual General Meeting will be held January 28-30 at Red Deer College in the Team Teaching Theatre (look for signs from main door of college, registration beginning Friday, 7 pm, in the forum). To reach the college from Highway #2, from the north turn off highway at the first Red Deer exit, travel east on Gaetz Ave. through Red Deer until you come to the Capri Motel intersection, then turn right. From the south, exit the highway by going straight where highway bends to left at the north end of "motel row". Turn left at Capri motel intersection.

The theme for the weekend is "Varieties of Exploitation of Wildlife" featuring several speakers. Friday evening, 8 pm, will be a short program (one speaker) in the Theatre. Saturday, following the AGM at 9 am, field trips are scheduled for FAN members not obligated to attend the Director's Meeting. Saturday evening a 6 pm dinner ($6 per person) in the RDC cafeteria has been arranged. Advance notice (by Jan. 15) to Maryhelen Posey (282-3997) is required. Saturday evening's program begins at 7:30 pm in the Theatre, continuing the "Exploitation" topic with presentations by two guest speakers. Sunday morning, 10 am, we will hold a brief meeting calling for Resolutions. Recommended accommodations are the Capri Motel (medium-priced, nearest to the college) or Red Deer Lodge. Additional motels are located on Highway #2.

FAN RESOLUTIONS - 1982 AGM

"Whereas the Burgess Shale fossil site in Yoho National Park was officially dedicated as a World Heritage site on July 16, 1981;
And whereas the placement of the Burgess Shale on the World Heritage List at the 1980 meeting of the U.N.E.S.C.O. World Heritage Committee recognized this site to be of outstanding universal value forming part of the natural heritage of mankind;
And whereas this World Heritage site and the National Park of which it is a part are intended to be preserved for the benefit of future generations;
And whereas the Royal Ontario Museum is actively involved in exploration and excavation work at this site;
Be it resolved that: the Federation of Alberta Naturalists urges the Minister of the Environment to accept the responsiblity imposed by the World Heritage designation and order a halt to the exploitation of this resource and reaffirm his commitment to preserving the integrity of the Burgess Shale site."

"Whereas the Yamnuska Natural Area in the Bow Valley Corridor between Calgary and Banff was the subject of a publication of the Bow Valley Naturalists in 1974 which contained proposals for its protection and use; and
Whereas the final report of the ECA on land use in the Eastern Slopes recommended that because of its unique features the Yamnuska Natural Area should be designated a provincial park with limited facilities and the emphasis on interpretation; and
Whereas FAN, the Calgary Field Naturalists' Society, and many other groups and individuals supported these proposals; and
Whereas the Public Lands Division has identified the Yamnuska Natural Area as a

preferred site for the development of a 40 (forty) years' supply of gravel and further threats to the natural integrity of this area may be imminent;
Be It Resolved That the Federation of Alberta Naturalists urges the Government of Alberta act quickly to provide the Yamnuska Natural Area with the positive protection it deserves to perpetuate its unique and substantial natural history values and recreational and educational opportunities."

"Whereas the migratory caribou herds of northern Canada are of national and international importance as wildlife; and
Whereas the Kaminuriak and Beverly caribou herds are of importance to the native peoples who hunt them; and
Whereas these two herds have recently suffered very substantial decreases in size; and
Whereas the decrease in the case of the Kaminuriak herd is such that the entire herd may soon be lost; and
Whereas hunting by man has recently been at a greater rate than can be withstood by the existing populations; and
Whereas disturbance by industrial activities has also been cited as a contributing factor in the decreases;
Therefore We Resolve, The Federation of Alberta Naturalists, that the governments of Canada, Manitoba, Saskatchewan and the Northwest Territories, together with the appropriate native groups:
(1) Recognize the importance of the continued existence of these migratory caribou herds at healthy population levels; and
(2) Increase the level of communication among native people, other users, and scientists; and
(3) Gain broad support for the urgent need to curtail the current rate of kills and wastage; and
(4) Press forward vigorously with a caribou management group representing native user groups and government, to set and enforce appropriate limits on the total annual harvest from each herd, with first priority to subsistence hunting; and
(5) Halt or slow down the resource exploration and development activities on land used by these caribou until their impacts on the herds have been properly studied, and to monitor the effects of any such activities that are permitted; and
(6) Increase the level of research into caribou biology, particularly their distribution and movements, population dynamics, and habitat requirements."

"Whereas Alberta's wildlife is valuable to all Albertans; and
Whereas as Alberta's population grows, hunting and fishing pressure increases in the Province; and
Whereas increased hunting and fishing activity invariably results in an increase in the numbers of violations of hunting and fishing regulations:
We Therefore Resolve, The Federation of Alberta Naturalists, to urge the governments of Alberta and Canada:
(1) To increase substantially the number of wildlife officers in each hunting zone in Alberta; and
(2) To increase the minimum fines for infractions of fishing and hunting regulations; and
(3) To embark on an extensive public awareness program to inform those who are not reached by the Hunter Training Program, of laws governing the hunting of game and the angling of fish in Alberta."

[All these Resolutions were sent to the appropriate officials early this year - ed.]

PUBLIC ADVISORY COMMITTEE REPORT

Attendance at our meetings has declined since last year, and twice we were unable to conduct business because we lacked a quorum. This problem may be partially due to late notification of meetings and delays in circulating the agenda.

This year all the Study Groups have defined their terms of reference and planned their programs for the year. My Study Group began the new year with a success. As a result of our patient efforts, the practise of dumping animal wastes from international flights into public landfill sites has been stopped. They will now be burned in specially constructed incinerators at the airports.

Loss of land to urban growth was the topic of our February meeting. The guest speakers represented T.O.P.S.O.I.L. and the Edmonton Metropolitan Regional Planning Commission. It is estimated that Edmonton will use some 23,000 acres of agricultural land by the turn of the century.

Peter Trynchy was asked to provide a speaker for our March meeting to inform us about plans for future Kananaskis Country-type developments. The Minister declined our request because there are no plans for more "countries". Our program was changed to discussion of country residential developments. Guest speakers were a municipal planning manager and a past president of a rural ratepayers association.

In April, Diane Griffin and Murray Turnbull gave us an update on grasslands management. Murray explained Alberta's grazing policy and how carrying capacity and grazing fees are determined. Diane talked about the new Ecological Reserves Act, and how it relates to grasslands.

The May meeting again dealt with grasslands. Abner Grover and Pat Rutledge from the Special Areas Board gave the reasons for the sale of the tax recovery lands in the Special Areas. These were (1) security of tenure, many of the leaseholders are dependent upon leased land; (2) control over access particularly during hunting season. The special Areas Board regards the land being sold as coming under their jurisdiction and not that of the province. This was hotly disputed by Ron Gradish of the A.F.G.A. Cliff Wallace of the AWA was concerned that no planning had been undertaken to ensure that valuable habitat and areas of special significance were identified and researched before being sold. The members of the Special Areas Board maintained that all the land up for sale was presently under cultivation or had previously been cultivated. This statement was disputed, and the Board has been asked to supply some supporting figures to clarify this important point. As native grasslands are very scarce in Alberta the native grasslands in the Special Areas provide much-needed habitat for native species of plants and animals. It will be a great loss if they are sold and cultivated. The AFGA was also concerned about access to the crown lands scattered throughout the Special Areas, and subsequent pressures to sell these lands. The Chairman of the Special Areas Board did state that the Board will not sell any lakeshore or river frontage land.

Other items coming up at our meetings include: The Grande Prairie/Grande Cache Road; The Odyssey; Marmot Basin Ski Area; Blackfoot Grazing Reserve; access to provincial land; Downhill skiing in Kananaskis Park and Kananaskis Country; federal land use policy; suffield; and logging in the Castle River Watershed.

- Submitted by Dorothy Broadbent
FAN Representative, Public Advisory
Committee, May 1982

EDITOR'S PAGE

(Yes, Virginia, bats do fly upside down. . . or so the University of Alberta printers assure me. On their behalf, I apologize for the September cover drawing.)

I hate to sound like a broken records, but here goes. . . deadlines for submission of all projects reported in the AN Supplement are upon us, with the exception of the Christmas Bird Counts, which are due January 15. (Please mail them to my home address, incidentally.) I'm pleased to report that of the 11 "official" CBC's last year, we will increase by at least 2. Mike O'Shea is initiating an "official" count from Lethbridge, and Dunstable is now "official". When you submit count results to me for compilation in the AN, please let me know if your results will also be a part of the Audubon Society's CBC Count so I can record the results with appropriate publication credits.

LETTER TO THE EDITOR

August 10, 1982

"Dear Virginia,

I enjoyed the recent issue of FAN 12(2), June 1982. I comment you for the variety of articles.

The note on Alberta Banders Reach High Totals was pleasing to see we can do big things in Alberta. In regards to my contribution, these records could not have been credited to me without the enthusiastic and dedicated assistance of several people such as E. (Hardy) Pletz and Pres Winter plus several others who banded many of these birds. They ensured that the future returns on these species will provide us the needed information to undertake a better management programme on these birds. It is hoped that more Albertans will join us in this banding programme.

Sincerely, J.C. (Cam) Finlay

CLUB NEWS

BOW VALLEY NATURALISTS

The BVN had a busy fall/early winter. Meeting programs have included: "Future Summer Use and Interpretation at Sunshine"; "Backcountry Management in the Four Mountain Parks"; and a member's slide night. The Christmas Bird Counts are scheduled for December 18 (Banff/Canmore - about which they say "look out Edmonton and Calgary!") and January 1 (Bow Summit).

BUFFALO LAKE NATURALISTS

The BLN have scheduled their two bird counts (Stettler and Erskine) for December 19 and December 26. Their Annual General Meeting will be held January 20 at the SRC Hall.

CALGARY FIELD NATURALISTS' SOCIETY

At our first meeting of the 1982-83 season we showed a film on "The Art of Robert Bateman". This is a delightful 25-minute film obtainable from the National Film Board which we recommend to any group needing a short 'filler'. In October we had an interesting talk on the Galapagos Islands by Michael Jackson and look forward to learning about "The Natural History of Dugongs" from Paul Anderson in November. December will be Member's Night.

We have moved our meetings to Room E241 in the Engineering Building at U. of C. where we have more space and plenty of parking. Meetings are the third Wednesday of each month and any of you visiting Calgary would be most welcomed.

Field trips have been to lakes in the area and to see the usual passage of migrant waterfowl, raptors, etc. and keen birdwatchers are flocking to Glenmore Reservoir to see an Ancient Murrelet, presumably wind-blown from the Pacific and only the second recorded in Alberta. While it is giving our birders a thrill and seems healthy and energetic at present, the lost bird will, unfortunately, be unable to survive once the ice forms.

- Submitted by Dorothy Broadbent

EDMONTON BIRD CLUB

The EBC, Edmonton Natural History Club and the Provincial Museum are presenting the following Audubon Wildlife Films: "Where the Sea Begins", Jan. 22; "Inside Passage to Alaska" Feb. 19; and "Hawaii: An Insider's View" May 7. All will be shown at the Provincial Museum, 8 pm. For further information phone Ronald McElhaney, 434-2325.

EDMONTON NATURAL HISTORY CLUB

The fall field trip schedule included trips to Ministik Hills Field Study Centre to look for mushrooms, a Beaverhill outing, a trip to the Genesee Fossil Beds, and trips to Wagner Bog and the Hastings/Cooking Lake area.

RED DEER RIVER NATURALISTS

RDRN have again arranged to purchase sunflower seeds by bulk for resale, at a discount, to members. That is an interesting idea other clubs might wish to explore.

NOTES AND NEWS

HIGH ARCTIC PARK PROPOSED

The Federal Government and the Government of the Northwest Territories have agreed, in principal, to establish a national park reserve on Ellesmere Island. The proposed park would cover at least 39,500 square kilometers and would include mountain ranges, glaciers, ice shelves, fiords and Lake Hazen, the largest lake north of the Arctic Circle. Two sites within the proposed park, Tanquary Fiord and Lake Hazen, have already been identified as International Biological Program sites in recognition of their ecological importance. Because of the extreme sensitivity of this high-arctic area, park development plans bear careful watching.

ECOMUSEUM PLANNED AT MCGILL UNIVERSITY

The St. Lawrence Valley Natural History Society has recently launched a $4 million plan to build an ecomuseum on a 20-hectare site on the Macdonald Campus of McGill University at Ste. Anne de Bellevue, Quebec. The project, designed to stimulate public interest both in the physical and biotic character of the Valley, will include a year-round indoor display area as well as outdoor areas and interpretive facilities. (Land Vol. 3 No. 2)

MCTAGGART SANCTUARY

As modern "civilization" rampantly gobbles up natural and semi-natural habitat for conversion into pavement and reservoirs, news of land to be preserved is always welcome indeed! AN readers in the Edmonton area will thus be delighted to learn (from New Trail 37(1): 8) of a new sanctuary to be established by the University of Alberta along the Whitemud Creek. The 128-acre parcel of land was donated to the University by Sandy A. McTaggart on condition that it be maintained in its natural state, with indigenous flora and fauna preserved. - Martin K. McNicholl

ORNITHOLOGICAL JOURNAL NEWS

A number of important events have recently taken place in journals which include Alberta in their publication area. The latest victim of economic times is Continental Birdlife, which will suspent publication after their next issue (Vol. 3 No. 4). The Cornell Laboratory of Ornithology has recently published the first issue of The Living Bird Quarterly, a glossy magazine. There is some confusion as to whether this replaces their newsletter or The Living Bird, an important annual. Two recent mergers will improve the publications involved. The Inland Bird Banding Association has joined the Eastern & Western Bird Banding Associations in publishing North American Bird Bander, which has thereby become truly North American. Finally, the American Ornithologists' Union and British Ornithologists' Union will merge their Recent literature listings with the first 1983 issues of

Auk and Ibis, providing the most comprehensive coverage of bird literature in the world, and, yes, A.N. will be included. - Martin K. McNicholl

NEW NORTH AMERICAN CHECK LIST OF BIRDS

In recent years, bird-watchers have had to contend with a rather confusing array of names, both English and scientific. The latest edition of the American Ornithologists' Union check-list was published in 1957 and with new understandings of species groups, relationships, etc., has become very much outdated. In 1973, the check-list committee published a major supplement, which updated many English and scientific names and also combined several species as races of one (e.g. flickers, orioles, juncos) and separated a few others (e.g. Alder and Willow Flycatchers). In 1976, the committee published a shorter supplement which updated several scientific names (e.g. combining Acanthis and Spinus into Carduelis). All this has meant that a writer needed to check all three sources to ensure that the correct names were used. A further complication has arisen when some authors have used names from the not-yet published 6th edition of the check-list. For example, Roger Tory Peterson referred to Sedge Wrens in his 1980 edition of his eastern field guide. The 6th edition will finally be published in 1983, but impatient observers and writers need not wait until then to be up to date. The check-list committee has published the 34th supplement as a supplement to Auk 99(3), 1982. This supplement lists all species in North America (Canada and the U.S.) documented to December 1981 under their proper current names and in the current check-list order. Observers wishing only the check-list, and not the detailed distribution which will be available in the 6th edition, should find this supplement very handy, and even those wishing the full details will find the supplement a useful quick-check source when writing a paper involving several species. This 16 pp. list can be ordered for $3.00 U.S. from: G.E. Woolfended, Dept. of Biology, Univ. of South Florida, Tampa, Fla. 33620, USA. - Martin K. McNicholl

CKUA TAKES LISTENERS FOR A 'WALK IN THE WILD'

Access Radio CKUA has begun a weekly program hosted by Lorne Wallace called "A Walk in the Wild", airing Sundays at 12:15 pm. The 15-minute programs are designed with a provincial focus in mind and with the help of outdoorsmen, scientists and other naturalists, Mr. Wallace will feature specific topics of interest and concern. Listeners will be treated to visits to little-known natural areas around Alberta where some of the most interesting wildlife abound.

ACID RAIN FORECAST STUDY

A study forecasting acid rain-causing sulphur dioxide emissions in the province to the year 2000 was released Oct. 26 by Alberta Environment. The study, undertaken by western research for the department, forecasts a modest increase in sulphur dioxide emissions for the near future (up to 1985), followed by a reduction in emissions to the year 2000. The study forecast indicates the goal of maintaining sulphur dioxide emissions at or below current levels to the year 2000 can be met.

Alberta Environment commissioned the study in response to the 1981 report of the federal subcommittee on acid rain which recommended Alberta give high priority to controlling acid rain-causing pollutants from industries. The committee also recommended Alberta adopt a goal of zero increase in acid rain-causing emissions over current levels up to the year 2000 and prescribed annual decrease thereafter.

The forecast is based on a number of industrial development scenarios, in-

cluding an optimistic high growth outlook and a more conservative outlook.

All major sectors of the Alberta economy that may emit sulphur dioxide are examined, including natural gas and conventional oil production, oil sands development, electric power generation and other small emitters such as fertilizer, pulp and paper and refinery industries. - Alberta Farm Life, Nov. 3

1981 BANDING: JONES BANDS 99 SPECIES

The Annual Report of the Western Bird Bander Association for 1981, published in North American Bird Bander 7: 72-84, 1981, lists Edgar T. Jones of Edmonton as having banded 3402 birds of 99 species. According to the accompanying commentary by Steve Ervin (NABB 7:85-86), this was the highest number of species banded by an individual and was exceeded only by the Point Reyes Bird Observatory, with 135 species. Eddie has topped or nearly topped other banders in number of species in several other years, and again highest totals of several species come from Alberta banders, as follows: White Pelican (196-Gary Erickson); Double-crested Cormorant (1728-Erickson Mallard x Black Duck hybrid (1-Bruce Turner); Mallard x Gadwall hybrid (1, first ever banded in WBBA territory - Turner), Red-tailed Hawk (72-Jones), Broad-winged Hawk (1-Jones), Swainson's Hawk (66-Jones), Ferruginous Hawk (73-Erickson), Merlin (85-Erickson), Ring-necked Pheasant (1-Jones), Whooping Crane (1-Ernie Kuyt), Greater Yellowlegs (1-Jones, tied with a B.C. bander); Lesser Yellowlegs (2-Jones); Great Horned Owl (83-Jones); Hawk Owl (12-R. Gehlert); Common Flicker - Yellow-shafted race (10-Jones); Downy Woodpecker (12-Jones); Eastern Phoebe (1-Jones); Yellow-bellied Flycatcher (3-Jones); "Traill's" Flycatcher (12-J. Cam Finlay): Alder Flycatcher (9-Jones); Least Flycatcher (64-Jones); Cliff Swallow (36-Finlay); Purple Martin (403-Finlay); Blue Jay (48-Finlay); Common Crow (18-Finlay); Black-capped Chickadee (125-Finlay); Boreal Chickadee (8-Finlay); American Robin (82-Jones); Gray-cheeked Thrush (2-Jones); Mountain Bluebird (443-Finlay); Water Pipit (1-Finlay); Bohemian Waxwing (30-Finlay); Cedar Waxwing (51-Finlay); Northern Shrike (1-Finlay, tied with 2 other banders); Red-eyed Vireo (50-Jones); Philadelphia Vireo (8-Jones); Black-and-white Warbler (12-Jones); Tennessee Warbler (473-Jones); Magnolia Warbler (17-Finlay); Myrtle race of Yellow-rumped Warbler (555-Jones); Black-throated Green Warbler (1-Jones); Bay-breasted Warbler (4 each, Finlay & Jones Blackpoll Warbler (26-Finlay); Palm Warbler (13-Jones); Ovenbird (65-Jones); Northern Waterthrush (12-Jones); Connecticut Warbler (2 each-Finlay, Jones); Mourning Warbler (6-Jones); Canada Warbler (5-Finlay); American Redstart (84-Jones); Baltimore race of Northern Oriole (49-Jones); Western Tanager (28-Jones, tied with Point Reyes); Rose-breasted Grosbeak (21- [?]); Evening Grosbeak (705-Finlay); Leconte's Sparrow (2-Jones); Sharp-tailed Sparrow (1-Jones); Slate-colored race of Dark-eyed Junco (93-Jones); Tree Sparrow (57-Jones); Chipping Sparrow (407-Jones); Clay-colored Sparrow (35-Jones); White-throated Sparrow (126-Jones); and Swamp Sparrow (10-Jones). In addition, Fred C. Zwickel of the Dept. of Zoology at the University of Alberta is listed, as expected, with the highest number of Blue Grouse (548), but these were banded on Vancouver Island.

- Martin K. McNicholl

RARE SPECIES UPDATE

The worldwide-renowned Narcisse red-sided garter snake dens, 125 km north of Winnipeg, have been designed a Wildlife Management Area. . .As of last spring, there is finally some good news regarding the California Condor. One chick was sighted, another was probable based on behaviour of a nesting pair, and a third was possible. The third pair lost eggs (the first egg was accidentally kicked out of the nest, the second was taken by marauding ravens, and there was hopes a third egg was laid) but, most importantly, this confirmed the California Condor will double-clutch after an egg loss and opens the possiblity of captive breeding

without hurting the wild population. Of 30 known wild birds, four pair are believed to be active breeders. (BirdScope). . . Meanwhile, still in California, the crazy person or persons who have been de-beaking wild Brown Pelicans continue on their spree. However, their new tactics include debeaking much closer to the head, making surgical repair impossible. . . As of last spring, the population of the Everglades Kite stood at an estimated 225 individuals, little more than 1/3 of last year's population of 650. During the 1981 drought, the ponds and marshes that supported apple snails, the preferred food of the kites, dried up. Snails were so scarce in some areas this spring that the near-starving kites turned to small turtles. One biologist reported observing a kite spent almost two hours eating one. During a severe drought in 1971, the kite population dropped to an all-time low of 60. (The Wood Duck, Vol. 36 No. 1). . . . The International Whaling Commission finally voted this year to end commercial whaling. Operations of commercial whalers will be phased out over the next three years. Among the opposing nations, Japan, Norway and Iceland recently filed formal objections to the measures adopted last summer. There are also reports that Japan may be attempting to archestrate a mass pull-out from the IWC, a move which would seriously cast into doubt the future of that organization. . . . The Peregrine Fund at Fort Collins, Colorado, successfully released 49 more young Peregrine Falcons last summer. . . An exhibit specimen of the extinct Labrador Duck was stolen from the American Museum of Natural History in January. The Museum is offering a $500 reward for information. (BirdScope). . .And, on an up note, astounding news! 23 Eskimo Curlews were reported on Atkinson's Island, south Texas, by two biologists, David Blankenship and Kirke King, May 7, 1981. This regal shorebird was thought to be extinct by some, and the 1981 sightings were of more of these birds than have been seen in total since 1932! (BirdScope).

BITS 'N PIECES

Citizens' Bulletin, published jointly by Friends of the Earth and Environment and Environment, has bit the dust. Environment Canada will consider a new proposal for a replacement publication. . . Meanwhile, Canada's Friends of the Earth group is undergoing revitalization, beginning with the hiring of a new Executive Director and the launch of a fundraising campaign. . . The White-winged Dove, a southwestern bird similar to the Mourning Dove, has established a breeding population in Florida. The wild population, developed from captive escapees, is now large enough that they have been added to Florida's game bird list. (BirdScope). . . William W.H. Gunn has received the 14th annual Arthur A. Allen Award from Cornell's Laboratory of Ornithology. . . Al Wiseley has topped the American Birding Association's 1981 Alberta list of most species seen, with 312 species. Al's lifelist as of 1981, 376 species, ranks 30th in Canada. Interestingly enough, of the twenty-one names on the 1981 Alberta list, only three (Wiseley, Richard Palindat and Andrew Slater) are Alberta residents! (ABA Supplement, Vol. XIV No. 2). . . The recipient of the 1982 Pimlott Conservation Award is Dr. Vladimir J. Krajina, professor emeritus of botany at the University of British Columbia. (Nature Canada 11(4)). . . . A small colony of three pairs of Eared Grebes raised 12 chicks in Cook County's Riverdale, Illinois, the first nesting of this species for Illinois. The grebes have appeared intermittantly at the site since 1978. (BirdScope). . . Every once in awhile a truly unusual migration report based on a banded bird surfaces. One such was an immature Laughing Gull banded on July 19, 1979, near Barnegat Light, New

Jersey. Five months later it was recovered on the island of Kauai, Hawaii, some 8,000 km away. (BirdScope). . . Al Karvonen, of Karvonen Films Ltd., has received the Merit Award for Best Cinematographic Treatment of a Species in its Habitat, awarded at the Wildlife Film Festival, Missoula, Montana. His film, "Autumn with Grizzlies", was designed for upper elementary and high school biology. . . FAN's "Bird Banding in Alberta" received a good review by Wayne C. Weber in the Canadian Field Naturalist. . . Copies of "Wild Mammals of Western Canada", by Arthur and Candace Savage, has been donated to Alberta public schools by the Recreation, Wildlife and Parks Foundation. . .The "winter" term at the Devonian Botanic Garden begins in February and runs until the end of April. Courses will include such topics as: Flower, Vegetable and Organic Gardening, Botanical Illustration, Birdwatching, Prairie Wildflower Gardening, plus many others. For details contact The Friends of the University of Alberta, Devonian Botanic Garden, Room B414, Bio. Sci. Centre, Edmonton AB T6G 2E9, or phone 987-3054. . . Friends of the Earth have compiled their work on a soft energy path for Canada. With funding from Energy, Mines and Resources, FOE has prepared a soft energy path for Canada as a whole, and for each province and territory. Copies of the reports will soon be available, and FOE is attempting to prepare a synthesis of the 1,000-page report that will be available to the public. As well, Hurtig Publishers will be publishing a book form of the report, with Bob Bott as author. For more information contact FOE, 53 Queen Street, Ottawa.

JUNIOR NATURALISTS' SECTION

LITTLE BROWN DEER

by Grade 2H, Nanton
Teacher, Maureen Hinman

Tune: Winnie the Pooh

Little Brown Deer, in the forest
bounding through the bushes
on his strong, long legs.
Little brown deer, with his white spots,
Hiding in the leaves so still.

Gracefully walking to his mother
Drinking his milk so slowly
Going to sleep so quietly
His mother licks him goodnight

Little brown deer, waking up now
Going to the lake for a drink of water
Nibbling a leaf, prancing around
Having such a busy day.

A QUIN-ZHEE

The quin-zhee is an Indian-style snow shelter made by heaping snow into a large pile and hollowing out the interior.

Choose a site where the snow cover is unobstructed and has not been disturbed. Pile up a mound of snow, about 2 metres high and 3 or 4 metres in diameter. Let the pile of snow set before tunneling into it. The greater the difference in shape and temperature of the snow crystals near the surface and near the ground, the more recrystalizing will occur in the mixed snow pile. The mound will set in an hour or so when it's really cold.

Begin burrowing through a hole in the mound at ground level. Keep the entrance just big enough for one person to crawl in. Start to hollow out overhead, leaving the bottom layer for support to the last. You can tell the right thickness of the walls when you see the outside light beginning to glow through. At least 20 cm of snow wall is needed to insulate the inside from the outside.

Close the entrance with a block of snow or a backpack and make a small hole for ventilation at the top. Just like the pukak layer, the quin-zhee, if built in the shade, can provide shelter all winter long. Inside temperatures will be more moderate than those outside, especially when warmed by several occupants.

Start developing quin-zhee building know-how in a backyard to school courtyard. Try a sleepout in a backyard quin-zhee before attempting a wilderness sleepout. Use insulating foam pads to prevent heat loss through the bottoms of sleeping bags. Try a candle or two for creating a cozy atmosphere.

Alice in Wonderland changed size and entered a rabbit's burrow. Alice in Winterland needs only to enter a quin-zhee to experience the subnivean (under snow) world of the deer mouse. The environment in a quin-zhee is like that of the mouse under the snow blanket. The snow cover limits light, muffles noise, and entraps moist air.

-from "Winter Here and Now" by Joy Finlay, illustrations by Joan Heys Hawkins, published by Alberta Environment, Communications Div.

THE MOOSE SONG

by Grades 1 and 2, Paddle Prairie
Teacher, Wanda Irvine

Tune: Baa, Baa, Black Sheep

Way up North
There's sure a lot of moose
Yes sir, yes sir,
And they are all loose.

Some are cows and
some are calves
And when you see a bull
You never laugh.

If You're going hunting
You'd better take a gun
And if you miss
You'd better run.

We can use a moose
For many things
Money, food and even rings.

When you shoot a moose
There's a lot of things to do
Gut it, skin it
And hang it up for two.

Some of us like dry meat
Cause it is really good
If we could have some right now
WE SURE WOULD!!

THE BEAVERS GO SWIMMING

by Grade 3, Calder School, Edmonton
Teacher: Cindy Kachmar

Tune: The Ants Go Marching

The Beavers go swimming one by one
Stroke, stroke Stroke, stroke
The Beavers go swimming one by one
Stroke, stroke Stroke, stroke
The Beavers go swimming one by one
The little one stops to look at the sun
And they all go swimming
Back to the wood, to chop trees if they could
Chop, chop, chop. . .

-The Beavers go swimming two by two. . .
The little one stops when an owl says Who-o-o-o
-The Beavers go swimming three by three. . .
The little one stops to chase a bee.
-The Beavers go swimming four by four. . .
The little one stops, his legs were sore.
-The Beavers go swimming five by five. . .
The little one stops to take a dive.
-The Beavers go swimming six by six. . .
The little one stops to chew some sticks.
-The Beavers go swimming seven by seven. . .
The little one stops to swim to Devon.
-The Beavers go swimming eight by eight. . .
The little one stops to find a mate.
-The Beavers go swimming nine by nine. . .
The little one stops to scratch his spine.
-The Beavers go swimming ten by ten. . .
The little one stops to do it again.

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